Ontario. Hydro-Electric Power Commission.

(15)

Seventh Annual Report

OF THE

HYDRO-ELECTRIC POWER COMMISSION

OF THE

PROVINCE OF ONTARIO

FOR YEAR ENDED OCTOBER 31st

1914

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

TORONTO:
Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1915

Printed by
WILLIAM BRIGGS
29-37 Richmond Street West
TORONTO

To His Honour the HONOURABLE JOHN STRATHEARN HENDRIE, C.V.O.,

Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the Seventh Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1914.

Respectfully submitted,

ADAM BECK,

Chairman.

TORONTO, February 15, 1915.

SIR ADAM BECK, K.B.,

Chairman, Hydro-Electric Power Commission,

Toronto, Ont.

SIR,—I have the honour to transmit herewith the Seventh Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1914.

I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

SIR ADAM BECK, K.B., London, Chairman

HON. I. B. LUCAS, M.P.P., Markdale, Commissioner

W. K. McNAUGHT, C.M.G., Toronto, Commissioner

W. W. POPE, Secretary

F. A. GABY, Chief Engineer

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OF THE

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SECTION I

LEGAL PROCEEDINGS

ACTS

The following Act with respect to the public construction and operation of Electric Railways was passed by the Legislature of the Province of Ontario during the Session of 1914.

This Act invests the Commission with power to act on behalf of the municipal corporations interested to issue bonds for the carrying on of the work, taking the debentures of the corporations as security, and thus provide ways and means for the financial undertaking of work in this connection.

The Hydro-Electric Railway Act

4 Geo. V., Chap. 31

An Act respecting the Public Construction and Operation of Electric Railways.

Assented to May 1st, 1914.

Preamble. WHEREAS it is expedient to provide for the economical and efficient construction and operation of electric railways in localities in which municipal corporations are willing to provide and bear the cost of the work, and that in order to further the success of the undertaking means should be provided for the co-operation of the municipal corporations interested and that the work should be undertaken by or under the direction of the Hydro-Electric Power Commission of Ontario acting for and on behalf of the municipal corporations interested; and whereas it appears that the funds required for carrying out any such undertaking can best be provided by the issue of bonds by the Commission, such bonds to be a charge upon the railway and other works comprised in the undertaking, the debentures of the several corporations interested being deposited as collateral security for the payment of the said bonds, and neither the Province nor the Commission being liable for the payment thereof except to the extent of the moneys received by the Commission from time to time from the municipal corporations;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows—

Short title.

1. This Act may be cited as *The Hydro-Electric Railway Act*, 1914.

Interpretation.

2. In this Act,

"Commission."

(*a*) "Commission" shall mean the Hydro-Electric Power Commission of Ontario.

"Corporation."

(*b*) "Corporation" shall mean a municipal corporation other than a municipal corporation of a county.

Inquiry and report by Commission

3. Whenever required by the Lieutenant-Governor in Council so to do, the Commission may enquire into, examine, investigate and report upon,—

Rev. Stat., c. 39.

(*a*) the cost of constructing and operating an electric railway in any locality in which electrical power or energy may be supplied by the Commission under *The Power Commission Act;*

(*b*) the municipalities the inhabitants of which will be served by the railway;

(*c*) the population of each of such municipalities as shown by the last enumeration thereof by the assessors;

(*d*) an estimate of the probable revenue from the railway;

(*e*) the practicability of the undertaking and its economic value to the locality to be served by it.

Agreement for construction and operation by Commission.

4.—(1) A corporation or two or more corporations may, if authorized by the Lieutenant-Governor in Council so to do, enter into an agreement with the Commission for the construction, equipment and operation of an electric railway to be operated by electrical power or energy supplied by the Commission.

Provisions of agreement.

(2) The agreement shall provide for

(*a*) the location of the line of the railway;

(*b*) the character of the equipment and service to be furnished and the maximum tolls or fares to be chargeable thereon;

(*c*) the proportion in which the cost of construction, equipment, maintenance and operation of the railway shall be borne by each of the corporations interested;

(*d*) the issuing of debentures of the corporation or of each of the corporations and their deposit with the Commission as collateral security for any bonds issued by the Commission for the construction of the railway;

(*e*) the proportion of the revenue from such railway to be paid annually by the Commission to each corporation after deducting the charges hereinafter mentioned;

(*f*) the construction of the railway upon any right of way acquired by the Commission for the transmission of electrical power or energy under *The Power Commission Act* and the amount chargeable to the railway by way of rental or otherwise for the use of such right of way. Rev. Stat., c. 39.

(3) The agreement may be in the form or to the effect set out in Schedule "A" with such variations, additions or alterations as the Lieutenant-Governor in Council may approve. Form of agreement.

(4) The agreement shall not be executed by the corporation or the Commission or come into effect until the terms thereof have been sanctioned by the Lieutenant-Governor in Council. Sanction of Lieutenant-Governor in Council.

(5) After such sanction shall have been obtained the council of the municipal corporation or of each of the municipal corporations interested may by by-law passed with the assent of the municipal electors authorized to vote on money by-laws under *The Municipal Act* approve of the agreement and direct its execution. Submission of by-law for approval of agreement. Rev. Stat., c. 192.

5.—(1) The by-law submitted to the electors shall recite Recitals in by-law.

(*a*) the estimated cost of the work;

(*b*) the portion of the cost of the construction and equipment of the line to be borne by the corporation of the municipality;

(*c*) the total annual amount estimated to be required for the maintenance of the railway and for sinking fund charges and interest;

(*d*) the portion of such amount to be borne by the municipality.

(2) The agreement shall be set out in the by-law or be published therewith. Agreement to be set out.

6.—(1) The Commission may raise money for the construction and equipment of the railway by the issue for and on behalf of the corporations of bonds charged upon and secured by the railway and all the assets, rights, privileges, revenue, works, property and effects belonging thereto or held or used in connection therewith and may from time to time increase such issue of bonds by any amount which it deems necessary to cover the cost of such construction and equipment or to provide for the extension or improvement of the railway. Bond issue by Commission.

(2) The bonds shall be payable in fifty years from the date of the issue thereof, but it shall not be necessary for the Commission to raise or provide for any sinking fund for the retirement of the bonds until after the expiration of the first ten years of the said period of fifty years. Terms of bonds. Sinking fund.

Application of revenue to sinking fund for retirement of bonds.

(3) In order to provide for the payment of such bonds as the same become due the Commission may out of the revenue of the railway after payment of working expenses including the supply of electrical power or energy and the cost of administration set aside a sufficient sum to provide a sinking fund for the purpose of redeeming the bonds at maturity.

Province and Commission not to be liable for bonds.

7. Neither the Province of Ontario nor the Commission shall be liable in any manner for the payment of such bonds except to the extent of

(*a*) the moneys received by the Commission as revenue from the operation of the railway after payment of working expenses, including the cost of electrical power or energy and the cost of administration; and

(*b*) the moneys received from the corporations or from the sale of the debentures of the corporations for the payment of the bonds and the interest thereon.

Bonds may be guaranteed by Province.

8.—(1) Notwithstanding anything contained in section 7, the Lieutenant-Governor in Council may authorize the Treasurer of Ontario, for and on behalf of the Province, to guarantee the payment of the bonds issued by the Commission.

Form of guaranty.

(2) The form of the guaranty and the manner of its execution shall be determined by the Lieutenant-Governor in Council.

Annual payments of corporations.

9.—(1) The council of every corporation entering into an agreement with the Commission under this Act shall annually raise and pay over to the Commission its proportion of such sums as may be required by it for working capital or to meet any deficit in the cost of maintenance and operation of the railway, including the cost of the supply of electrical power or energy by reason of the revenue from the railway being insufficient to meet such charges, and shall also annually raise and pay over to the Commission its proportion of a sum sufficient to meet the interest on any bonds issued by the Commission under the powers conferred by this Act, and an annual sum sufficient to form in forty years from the expiration of the first ten years of the currency of the bonds a sinking fund for their retirement at maturity.

Annual adjustment and apportionment.

10. The Commission shall annually adjust and apportion the amounts payable by the municipal corporations under the next preceding section.

Deposit of debentures of corporation with Commission.

11.—(1) After the execution of the agreement as provided by section 4 the corporations shall issue and deposit with the Commission debentures to the amounts respectively apportioned as their respective shares of the cost of the construction and equipment of the railway and shall from time to time thereafter upon the requisition in writing of the Commission issue and deposit with the Commission such further debentures as may be required for the construction, completion, extension or improvement of the railway, in the proportions fixed by the agreement.

(2) The debentures so issued shall be held by the Commission as collateral security for the bonds issued by the Commission under section 6, and when any corporation party to this agreement shall make default in any payment required to be made by it under this Act or under the agreement, the Commission shall thereupon sell or otherwise dispose of so much of the debentures of such corporation as shall be necessary to supply such deficiency. Debentures to be collateral security for bonds.

(3) If the amount realized by the sale or other disposal of the debentures is insufficient, with the amount of the remaining debentures of the corporation to meet the share of the cost apportioned to the corporation, the corporation shall forthwith issue and deposit with the Commission debentures to a sufficient amount to make up the deficiency. Deposit of debentures to make up deficiency.

(4) It shall not be necessary to obtain the assent of the electors to any by-law for the issue of debentures under this section. Assent of electors not required.

12. Subject to the provisions of section 13, after the deposit of the debentures as provided by section 11, the Commission may construct, complete, equip, maintain and operate the railway as provided by the agreement, and for that purpose shall have and may exercise all the powers, rights, immunities and privileges of a company incorporated by special Act for the construction of a railway under *The Ontario Railway Act* so far as the same are applicable. Powers of Commission. Rev. Stat., c. 185.

13.—(1) Where land is required for any of the purposes for which land may be acquired or expropriated under *The Ontario Railway Act*, the Commission in respect thereof shall have the powers and shall proceed in the manner provided by *The Ontario Public Works Act* where the Minister of Public Works takes land or property for the use of Ontario, and the provisions of the said Act shall, *mutatis mutandis*, apply. Expropriation to be under. Rev. Stat., c. 35.

(2) Where compensation would be payable upon the exercise of any powers by the Commission under *The Ontario Railway Act* the same shall be determined in the manner provided by *The Ontario Public Works Act*. Compensation, how determined. Rev. Stat., c. 35.

(3) Sections 65 to 69 of *The Ontario Railway Act* shall not apply to the Commission or to any railway constructed by it. Rev. Stat., c. 185, ss. 65-69 not to apply.

14. Subject to the provisions of subsection 3 of section 6 the Commission shall apply the revenue derived from the operation of the railway to the payment of the working expenses of the railway and to the payment of the interest on the bonds issued under section 6, and after payment of the same shall annually pay over the balance, if any, to the corporations parties to the agreement in the proportions fixed thereby. Application of revenues.

15. No action or prosecution shall be brought against the Commission or any member thereof or any of its officers for anything done under this Act without the consent of the Attorney-General of Ontario. Action not to be brought without consent of Attorney-General.

Province and Commission not liable for errors in estimates, etc.

16. The Province shall not, nor shall the Commission, nor any member thereof, incur any liability by reason of any error or omission in any estimates, plans, or specifications prepared or furnished by the Commission.

Railway vested in Commission in trust for corporations.

17. Every railway and the works, property and effects held and used in connection therewith, constructed, acquired, operated and maintained by the Commission under this Act, shall be vested in the Commission in trust for the corporations parties to the agreement for the construction and operation of the railway.

Rev. Stat., c. 187, repealed.

18. *The Hydro-Electric Railway Act*, being chapter 187 of the Revised Statutes of Ontario, 1914, is repealed.

SCHEDULE "A."

This indenture made the day of , in the year of our Lord, one thousand nine hundred and ,

Between

The Hydro-Electric Power Commission of Ontario (hereinafter called the "Commission") of the First Part,

and

the Municipal Corporation of (hereinafter called the "Corporation") of the Second Part.

Whereas pursuant to *The Hydro-Electric Railway Act, 1914*, the Commission was requested to enquire into, examine, investigate and report upon the cost of construction and operation of an electric railway or railways to be constructed through certain districts in which the corporations are situated, together with the probable revenue that would result from the operation of such railway or railways;

And whereas the Commission has furnished the corporations with such a report showing (1) the total estimated capital cost, operating revenue and expenses of the railway or railways, and (2) the proportion of the capital cost to be borne by each of the corporations as set forth in schedule "B" attached hereto;

And whereas on receipt of the said report the corporations requested the Commission to construct, equip and operate a system of electric railways (hereinafter called the railway) over the routes laid down in schedule "A" attached hereto, upon the terms and conditions and in the manner herein set forth;

And whereas the Commission has agreed with the corporations on behalf of the corporations to construct, equip and operate the railway upon the terms and conditions and in the manner herein set forth; but upon the express condition that the Commission shall not in any way be liable by reason of any error or omission in any estimates, plans or specifications for any financial or other obligation or loss whatsoever by virtue of this agreement or arising out of the performance of the terms thereof;

And whereas the electors of each of the corporations have assented to by-laws authorizing the corporations to enter into this agreement with the Commission for the construction, equipment, and operation of the railway as laid down in the said schedules, subject to the following terms and conditions;

And whereas the corporations have each issued debentures for the amounts set forth in schedule "B" attached hereto, and have deposited the said debentures with the Commission;

Now therefore this indenture witnesseth:—

1. In consideration of the premises and of the agreements of the corporations herein contained, and subject to the provisions of the said Act, the Commission agrees with the corporations respectively:—

(*a*) To construct, equip and operate the railway through the districts in which the corporations are situate on behalf of the corporations;

(*b*) To construct and operate the railway over the routes laid down in schedule "A";

(*c*) To issue bonds, as provided in paragraph 3 of this agreement, to cover the cost of constructing and equipping the railway;

(*d*) To furnish as far as possible first-class modern and standard equipment for use on the railway, to operate this equipment so as to give the best service and accommodation possible, having regard to the district served, the type of construction and equipment adopted, and all other equitable conditions, and to exercise all due skill and diligence so as to secure the most effective operation and service of the railway consistent with good management;

(*e*) To regulate and fix the fares and rates of toll to be collected by the railway for all classes of service.

(*f*) To utilize the routes and property of the railway for all purposes from which it is possible to obtain a profit;

(*g*) To combine the property and works of the railway and the power lines of the Commission where such combination is feasible and may prove economical to both the railway and the users of the power lines;

(*h*) To permit and obtain interchange of traffic with other railways whereever possible and profitable;

(*i*) To supply electrical power or energy for operation of the railway at rates consistent with those charged to municipal corporations;

(*j*) To apportion annually the capital costs and operating expenses of all works, apparatus and plant used by the railway in common with the Commission's transmission lines in a fair manner, having regard to the service furnished by the expenditure under consideration;

(*k*) To apply the revenue derived from the operation of the railway and any other revenue derived from the undertaking to the payment of operating expenses (including electrical power), the cost of administration, and annual charges for interest and sinking fund on the money invested, and such other deductions as are herein provided for;

(*l*) To set aside from any revenue thereafter remaining an annual sum for the renewal of any works belonging in whole or in part to the undertaking;

(*m*) To pay over annually to the corporations, if deemed advisable by the Commission in the interests of the undertaking, any surplus that may remain after providing for the items above mentioned. The division of such surplus between the corporations to be fixed by the Commission on an equitable basis, having regard in the case of each corporation to the capital invested, the service rendered, the comparative benefits derived, and all other like conditions;

(*n*) To take active steps for the purpose of constructing, equipping and operating the railway at the earliest possible date after the execution of this agreement by the corporations and the deposit of the debentures as called for under clause 2 (*b*) hereof and to commence operation of each section as soon as possible after its completion;

(*o*) To make such extensions to the railway described in schedule "A" as may appear advantageous and profitable from time to time.

2. In consideration of the premises and of the agreements herein set forth, each of the corporations for itself, and not one for the other, agrees with the Commission:—

(*a*) To bear its share of the cost of constructing, equipping, operating, maintaining, repairing, renewing and insuring the railway and its property and works as established by the Commission, subject to adjustments and apportionment between the corporations by the Commission from time to time;

(*b*) To issue debentures for the amounts set forth in schedule "B" maturing in fifty years from the date of issue thereof, and payable yearly at the   Bank, at Toronto, Ontario. Such debentures shall be deposited with the Commission previous to the issuing of the bonds mentioned above, and may be held or disposed of from time to time by the Commission, as provided for in clause 4 hereof, in such amounts, at such rates of discount or premium, and on such terms and conditions as the Commission in its sole discretion shall deem to be in the interests of the railway, the proceeds of such debentures being used solely for the purposes herein contained. The amount of debentures of each corporation sold or disposed of from time to time shall be such proportion as may be fixed by the Commission of the total amount of debentures, due regard being given to the capital invested, the service rendered, the comparative revenue derived, and all other equitable conditions;

(*c*) To make no agreement or arrangement with, and to grant no bonus, license or other inducement to any other railway or transportation company without the written consent of the Commission;

(*d*) To keep, observe and perform the covenants, provisos and conditions set forth in this agreement intended to be kept and observed and performed by the corporations, and to execute such further or other documents and to pass such by-laws as may be requested by the Commission for the purpose of fully effectuating the objects and intent of this agreement;

(*e*) To furnish a free right of way for the railway and for the power lines of the Commission over any property of the corporations upon being so requested by the Commission, and to execute such conveyance thereof or agreement with regard thereto as may be desired by the Commission.

3. It shall be lawful and the Commission is hereby authorized to create or cause to be created an issue of bonds, and to sell or dispose of the same on behalf of the corporations. Such bonds to be charged upon and secured by the railway, and all the assets, rights, privileges, revenues, works, property and effects belonging thereto or held or used in connection with the railway constructed, acquired, operated and maintained by the Commission under this agreement, and to be for the total amounts mentioned in schedule "B" hereto attached; provided that the Commission may, upon obtaining the consent as herein defined of the majority of the corporations, increase the said bond issue by any amount necessary to cover the capital cost of extending the railway, and may also without such consent increase the said bond issue to cover the cost of additional works or equipment of any kind for use on the railway to an extent not exceeding ten per cent. (10%) of the bonds issued from time to time. In order to meet and pay such bonds and interest as the same becomes due and payable the Commission shall in each year after the expiration of ten years from the date of the issue of the bonds out of the revenue of the railway after payment of operating expenses (including electrical power) and the cost of administration set aside a sufficient sum to provide a sinking fund for the purpose of redeeming the same at maturity. Debentures issued by the corporations in compliance with clause 2 (*b*) hereof, shall, to the extent of the par value of any bonds outstanding from time to time, be held or disposed of by the Commission in trust for the holders of such bonds as collateral security for payment thereof; it being understood and agreed that in the event of any increase of the said bond issue each corporation shall, upon the request of the Commission, deposit with the Commission additional debentures as described in clause 2 (*b*) hereof, to be held or disposed of by the Commission as collateral security for such increase of the said bond issue, and that any debentures held by the Commission in excess of the par value of the outstanding bonds from time to time may be held or disposed of by the Commission to secure payment of any deficit arising from the operation of the railway.

4. In the event of the revenue derived from the operation of the undertaking being insufficient in any year to meet the operating expenses (including electrical power), the cost of administration and the annual charges for interest and sinking fund on the bonds, and for the renewal of any works belonging in whole or in part to the railway, such deficit shall be paid to the Commission by the corporations upon demand of and in the proportion adjusted by the Commission. In the event of the failure of any corporation to pay its share of such a deficit as adjusted by the Commission, it shall be lawful for the Commission in the manner provided in clause 2 (*b*) to dispose of debentures held by the Commission as security for any such deficit. Any arrears by any corporation shall bear interest at the legal rate.

5. Should any corporation fail to perform any of the obligations to the Commission under this agreement, the Commission may, in addition to all other remedies and without notice, discontinue the service of the railway to such corporation in default until the said obligation has been fulfilled, and no such discontinuance of service shall relieve the corporation in default from the performance of the covenants, provisos and conditions herein contained.

6. In case the Commission shall at any time or times be prevented from operating the railway or any part thereof by strike, lock-out, riot, fire, invasion, explosion, act of God, or the King's enemies, or any other cause reasonably beyond its control, then the Commission shall not be bound to operate the railway or such part thereof during such time; but the corporations shall not be relieved from any liability or payment under this agreement, and as soon as the cause of such interruption is removed the Commission shall, without any delay, continue full operation of the railway, and each of the corporations shall be prompt and diligent in doing everything in its power to remove and overcome any such cause or causes of interruption.

7. It shall be lawful for, and the corporations hereby authorize the Commission to unite the business of the railway with that of any other railway system operated in whole or in part by the Commission, and to exchange equipment and operators from one system to the other, proper provision being made so that each system shall pay its proportionate share of the cost of any equipment used in common.

8. If at any time any other municipal corporation applies to the Commission for an extension of the railway into its municipality the Commission shall notify the applicant and the corporations, in writing, of a time and place to hear all representations that may be made as to the terms and conditions relating to such proposed extension. If, on the recommendation of the Commission, such extension shall be authorized, without discrimination in favor of the applicant, as to the cost incurred or to be incurred for or by reason of any such extension, the Commission may extend the railway upon such terms and conditions as may appear equitable to the Commission.

No such application for an extension of the railway into any municipality the corporation of which is not a party to this agreement shall be granted if it is estimated by the Commission that the cost of service of the railway to the corporations parties hereto will be thereby increased or the revenue and accommodation be injuriously affected without the written consent of the majority of the corporations parties hereto.

9. The consent of any corporation required under this agreement shall mean the consent of the council of such corporations, such consent being in the form of a municipal by-law duly passed by the council of the corporation.

10. The Commission shall, at least annually, adjust and apportion between the corporations the cost of construction, equipment, operation, interest, sinking fund, and also the cost of renewing the property of the railway.

11. Every railway and all the works, property and effects held and used in connection therewith, constructed, acquired, operated and maintained by the Commission under this agreement and the said Act shall be vested in the Commission on behalf of the corporations; but the Commission shall be

entitled to a lien upon the same for all money expended by the Commission under this agreement and not repaid.

12. Each of the corporations covenants and agrees with the other:—

(*a*) To carry out the agreements and provisions herein contained;

(*b*) To co-operate by all means in its power at all times with the Commission to create the most favorable conditions for the carrying out of the objects of this agreement and of the said Act, and to increase the revenue of the railway and ensure its success.

13. In the event of any difference between the corporations the Commission may, upon application, fix a time and place to hear all representations that may be made by the parties, and the Commission shall adjust such differences, and such adjustments shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act Respecting Enquiries Concerning Public Matters.*

14. This agreement shall continue and extend for a period of fifty years from the day of , 1914, and at the expiration thereof be subject to renewal, with the consent of the corporations from time to time for like periods of fifty years, subject to adjustment and re-apportionment as herein provided for the purposes of this agreement as though the terms hereof had not expired. At the expiration of this agreement the Commission shall determine and adjust the rights of the corporations, having regard to the amounts paid or assumed by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

15. This agreement shall not come into effect until it has been sanctioned by the Lieutenant-Governor in Council.

The following Act was passed by the Legislature at its last Session to validate certain By-laws passed and contracts entered into with the various municipalities and also giving further powers to the Commission with reference to the acquiring of flooded lands on behalf of a Municipality. It also provides the means for Townships to light the streets and roads and gives further powers to the Commission relative to the appointment of Inspectors.

The Power Commission Act, 1914

4 Geo. V., Chap. 16

An Act to amend The Power Commission Act and to Confirm certain Municipal By-laws and Contracts.

Assented to May 1st, 1914.

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

Short title.

1. This Act may be cited as *The Power Commission Act, 1914*.

Rev. Stat., c. 39, s. 5, subs. 2, amended. Remuneration of Chairman.

2. Subsection 2 of section 5 of *The Power Commission Act* is amended by striking out the words "such salary or other remuneration" in the third and fourth lines and inserting in lieu thereof the words "the payment to him of any salary or other remuneration under this Act."

Rev. Stat., c. 39, s. 8, amended.

3. Section 8 of *The Power Commission Act* is amended by adding thereto the following as clause (*ee*) :—

Acquiring flooded lands on behalf of municipality.

(*ee*) Enter upon, take and use, without the consent of the owner thereof, any land which may in the opinion of the Commission be necessary for the full enjoyment and exercise of any water right, water privilege or improvement undertaken by the Commission or by any municipal corporation or for the relief of the municipal corporation from liability for damages for the flooding or overflowing of such lands, but the proceedings taken under this clause shall be at the sole expense of the municipal corporation, and the Commission may convey the land so acquired to the corporation or make such other disposition thereof with the consent of the corporation as may be deemed expedient.

Rev. Stat., c. 39, s. 23, cl. c, amended. Contribution by municipalities.

4. Clause (*c*) of section 23 of *The Power Commission Act* is amended by adding at the end thereof the words "and such sum not exceeding $15,000 per annum as the Lieutenant-Governor in Council may direct to be paid to the Chairman and other members of the Commission as remuneration for their services in addition to any sum payable to them out of the Consolidated Revenue Fund."

Rev. Stat., c. 39, amended.

5. *The Power Commission Act* is amended by inserting therein the following as Part II*a*.

PART II*a*.

SUPPLY OF POWER FOR STREET LIGHTING IN TOWNSHIPS.

30*a*.—(1) A majority of the resident freeholders according to the last revised assessment roll, residing within the area described in the petition and situated in the township, may petition the council of the township to take the necessary proceedings to procure from the Commission a supply of electrical power or energy for the purpose of lighting the streets or roads in the locality described in the petition.

Petition of residents in a locality for supply for street lighting.

(2) The petition shall be accompanied by the certificate of the clerk of the township stating that the petition is signed by a majority of the resident freeholders in the locality described in the petition as shown by the last revised assessment roll.

Certificate as to sufficiency.

30*b*.—(1) The council of the corporation shall thereupon request the Commission to supply electrical power or energy for the purposes mentioned in the petition.

Application by council to the Commission.

(2) Upon such request the Commission shall furnish to the corporation an estimate of the maximum cost per horse power at which the electrical power or energy will be supplied at the point of development or delivery by the Commission, and an estimate of the cost of constructing and providing the transmission lines by means of which the amount of electrical power or energy is to be supplied and of maintaining the same, and may furnish to the corporation plans and specifications of the works, plant, machinery and appliances necessary for the distribution of such power or energy for the purpose of lighting the streets or roads in the locality defined in the petition and an estimate of the cost thereof and such other information as the commission may deem advisable.

Estimates, etc., of cost to be furnished.

30*c*.—(1) Within one month after the delivery of the statements and estimates mentioned in the next preceding section the council shall at a special meeting called for that purpose, of which notice shall have been given to each of the petitioners, consider the statements and estimates furnished by the Commission.

Consideration of the estimates. plans, etc., by the Council.

(2) If at such meeting the petitioners or any of them desire to withdraw their names from the petition they may do so, and should the remaining names be insufficient to constitute a majority of the resident freeholders in the locality described in the petition, no further proceedings shall be taken thereon.

Withdrawal of petitions.

Power of council to pass a by-law authorizing contract.

(3) If at the close of the meeting there are sufficient names remaining of the petitioners to constitute a majority of the resident freeholders in the locality described in the petition, the corporation may, without submitting the same to a vote of the electors, and without any of the other formalities in the case of a by-law passed under Part I, pass a by-law for entering into a contract with the Commission for the supply of electrical power or energy for the purposes required by the petitioners and may enter into a contract with the Commission for that purpose.

Issue of debentures.

(4) The by-law may provide for the issue of debentures of the corporation payable within twenty years from the issue thereof to meet the cost of construction and installation of the works, plant, machinery and appliances necessary for the distribution of the electrical power or energy, and for the levying of a special rate upon the taxable property within the locality described in the petition for payment of principal and interest in the manner provided by *The Municipal Act*.

Rev. Stat., c. 192.

Special rate on property affected.

(5) All moneys required to meet the costs incurred by the corporation under this Part shall be raised, levied and collected by an annual special rate upon the taxable property lying within the locality described in the petition.

Annual payments to the Commission.

30*d*. All the provisions of Part I as to the annual payments to be made by corporations which have entered into contracts with the Commission shall apply to the contracts entered into under this Part.

Rev. Stat., c. 39, s. 37, subs. 1.

6. Subsection 1 of section 37 of *The Power Commission Act* is amended by adding thereto the following clause:

As to appointment of Inspector.

(*c*) The organization of the office of inspector, the qualification and duties of inspectors, and the form of the municipal by-law respecting the appointment of inspectors and prescribing such qualification and duties.

Rev. Stat., c. 39, s. 37, amended.

7. Section 37 of *The Power Commission Act* is amended by adding thereto the following subsections:—

Inspector, appointment of, by the Commission where municipality neglects.

(3) Where a municipal corporation refuses to appoint or in the opinion of the Commission unnecessarily delays the appointment of an inspector in accordance with the regulations, the Commission may make the appointment and fix the amount of the salary and allowance for necessary expenses of the inspector and the same shall be payable by the municipal corporation.

(4) An inspector may be authorized by the Commission to act in more than one municipality, and in that case the salary and expenses of the inspector shall be apportioned by the Commission between the corporations of the municipalities for which he is appointed and shall be payable by them as the Commission shall direct.

Authority of Inspector as to territory.

Expense in such case.

(5) Every appointment of an inspector by a municipal corporation shall be subject to the approval of the Commission, and no by-law for that purpose shall be passed or take effect until such approval has been obtained.

Appointments must be approved.

(6) A municipal corporation may by by-law impose such fees as may be thought proper for the inspection of works under this section, but the same shall at all times be subject to the approval of the Commission.

Fees for Inspector.

8. The municipal corporation of the Town of Walkerville, the municipal corporation of the Town of Strathroy, the municipal corporation of the Village of Elora, the municipal corporation of the Village of Fergus, the municipal corporation of the Village of New Toronto, and the municipal corporation of the Police Village of Thorndale, are added as parties of the second part to the contract set out in Schedule "A" to *The Power Commission Act, 1909*, as varied and confirmed by the said Act, and as further varied and confirmed by the Act passed in the tenth year of the reign of His late Majesty King Edward the Seventh, chaptered 16, as amended by the Act passed in the first year of the reign of His Majesty, King George the Fifth, and as amended by this Act, and the said contracts shall be binding upon the parties thereto respectively:

Certain municipal corporations made parties to contract. 9 Edw. VII. c. 19.

10 Edw. VII. c. 16. 1 Geo. V. c. 16.

As to the Town of Walkerville, from the 16th day of December, 1913;

As to the Town of Strathroy, from the 2nd day of March, 1914;

As to the Village of Elora, from the 10th day of November, 1913;

As to the Village of Fergus, from the 10th day of November, 1913;

As to the Village of New Toronto, from the 18th day of July, 1913;

As to the Police Village of Thorndale, from the 1st day of July, 1913.

9. The names of the said municipal corporations are added to Schedule "B" of the said contract, and such schedule shall be read as containing the particulars set out in Schedule "A" to this Act.

Names of corporations added to contract.

Contracts with Prescott, Brockville, Winchester, Chesterfield, Owen Sound and Ottawa confirmed.

10. The contracts set out as Schedules "B," "C," "D," "E," "F," and "G" hereto, between the Hydro-Electric Power Commission of Ontario and the Corporations of Prescott, Brockville, Winchester, Chesterville, Owen Sound and Ottawa are hereby confirmed and declared to be legal, valid and binding upon the parties thereto, respectively, and shall not be open to question upon any grounds whatsoever, notwithstanding the requirements of *The Power Commission Act*, or the amendments thereto or any other statute.

Rev. Stat., c. 39.

By-laws of Walkerville, Strathroy, Elora, Fergus, West Nissouri, Owen Sound, Prescott, Brockville, Winchester, Chesterville, and New Toronto, confirmed.

11. By-law No. 499 of the corporation of the Town of Walkerville, By-law No. 827 of the corporation of the Town of Strathroy, By-laws Nos. 522 and 525 of the corporation of the Village of Elora, By-law No. 475 of the corporation of the Village of Fergus, By-laws Nos. 229 and 239 of the corporation of the Township of West Nissouri, By-law No. 1523 of the corporation of the Town of Owen Sound, By-law No. 651 of the corporation of the Town of Prescott, By-law No. B828 of the corporation of the Town of Brockville, By-laws Nos. 316 and 322 of the Corporation of the Village of Winchester, By-laws Nos. 218 and 224 of the corporation of the Village of Chesterville, By-laws Nos. 11 and 14 of the corporation of the Village of New Toronto are confirmed and declared to be legal, valid and binding upon such corporations and the ratepayers thereof, respectively, and shall not be open to question upon any ground whatsoever, notwithstanding the requirements of *The Power Commission Act* or the amendments thereto or of any other statute.

Rev. Stat., c. 39.

By-law 1353 of Windsor amended and confirmed.

12. Notwithstanding anything contained in *The Municipal Act*, By-law number 1353 of the City of Windsor is amended by striking out the paragraph numbered 3 therein and substituting therefor the paragraph numbered 3 in the by-law as set out in Schedule "H" to this Act, and the said by-law as so amended is confirmed, and the debentures to be issued thereunder shall be issued and bear date and be payable as provided in the said by-law as so amended, and as so issued shall be legal, valid and binding upon the corporation of the City of Windsor and the ratepayers thereof.

SCHEDULE "A."

Additions to Schedule "B" to the contract set out in Schedule "A" to 9 Edward VII. c. 19.

Name of Municipal Corporation.	Maximum price of power at Niagara Falls.	No. of Volts.	Quantity of power applied for in h.p.	Estimate of maximum cost of power ready for distribution in municipality.	Estimate proportionate part of cost to construct transmission line, transformer stations and works for nominally 30,000 h.p. with total capacity of 60,000 h.p.	Estimate of proportionate part of line loss and of part cost to operate, maintain, repair, renew and insure transmission line, transformer stations and works for nominally 30,000 h.p. with total capacity of 60,000 h.p.
Walkerville ..	..	..	1,500	$38 00	$428,190	$18,665
Strathroy	..	..	200	44 07	63,716	3,319
Elora	..	..	200	33 97	42,294	2,541
Fergus	..	..	200	33 97	42,294	2,541
New Toronto..	..	..	50	28 00	8,076	482
Thorndale	..	..	80	45 00	23,548	1,515

SCHEDULE B

This Indenture made this twenty-sixth day of July, A.D. 1912, between the Hydro-Electric Power Commission of Ontario, acting herein on its own behalf and with the approval of the Lieutenant-Governor-in-Council (hereinafter called the Commission), party of the First Part, and the Municipal Corporation of Prescott (hereinafter called the Corporation), parties of the Second Part.

Whereas pursuant to "An Act to provide for transmission of electrical power to Municipalities," and the amendments thereto, the Corporation applied to the Commission to transmit and supply such power, and the Commission has entered into contracts with a Company or Companies for the supply of such power at the prices set forth in the schedule, hereto attached, and the Commission has furnished the Corporation with estimates, as shown in the schedule of the total cost of such power, and the electors of the Corporation assented to By-laws authorizing the Corporation to enter into a contract with the Commission for such power, and the Commission have estimated the line loss and the cost to construct, operate, maintain, repair, renew and insure a line to transmit such power to the Corporation, and have apportioned the part of such cost to be paid by each Corporation as shown in said schedule.

Now therefore this Indenture witnesseth that in consideration of the premises and of the agreements of the Corporation herein set forth, subject to the provisions of said Act and the amendments thereto, and of the said contracts subject to any variations thereof by the Corporation, the Commission agrees with the Corporation respectively:—

1. (*a*) To construct a line to transmit the quantities of electric power, shown in column 2 of the said schedule, to the Corporation shown in column 1 respectively.

(*b*) On the 1st day of December, 1912, or on any earlier day on which the Commission shall be prepared to supply said power in quantities set forth in column 2 of said schedule to the Corporation within the limits thereof, ready for distribution at approximately the number of volts set forth in column 4 of said schedule, and approximately 60 cycles per second frequency.

(*c*) At the expiration of three months' written notice, which may be given by the Corporation or any of them from time to time during the continuance of this agreement, to supply from time to time to the Corporation in blocks of not less than 100 horse-power each, additional power until the total amount so supplied shall amount to 15,000 horse-power or such further amount as the Commission may be able and willing to supply.

(*d*) To use at all times first-class, modern, standard, commercial apparatus and plant and to exercise all due skill and diligence so as to secure the most perfect operation of the plant and apparatus of the Corporation.

In consideration of the premises and of the agreements herein set forth each of the Corporations for itself, and not one for the other, agrees with the Commission:—

2. (*a*) Subject to the provisions of paragraph 2 (*g*) hereof, to pay to the Commission for the quantities of power shown in column 2 of said schedule to be supplied as aforesaid from the date when the Commission notifies the Corporation that it is ready to supply such power, and for all additional power held in reserve upon any of the above mentioned notices from the respective dates thereof until the termination of this agreement, the price set forth in column 3 of said schedule in twelve monthly payments, in gold coin of the present standard of weight and fineness, and bills shall be rendered by the Commission on or before the fourth and paid by the Corporation on or before the fifteenth of each month. If any bill remains unpaid for 15 days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of such power to the Corporation in default until said bill is paid. No such discontinuance shall relieve the Corporation in default from the performance of the covenants, provisos and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(*b*) To take electric power exclusively from the Commission during the continuance of this agreement; provided, if the Commission is unable to supply said power as quickly as required, the Corporation may obtain the supply otherwise until the Commission has provided such supply, thereupon the Corporation shall immediately take from the Commission; and the Corporation may generate, store or accumulate electric power for emergencies, or to keep down the peak load of the power taken from the Commission; and nothing herein contained shall affect existing contracts between the Corporation and other parties for a supply of electric power, but the Corporation shall determine said contracts at the earliest date possible.

(*c*) To pay, annually, interest at four per cent. per annum upon its proportionate part of the moneys expended by the Commission on capital account for the construction of the said line, transformer stations and other necessary works, shown, respectively, in column 6 of said schedule, subject to adjustment under paragraph 9.

(*d*) To pay an annual sum for its proportionate part of the cost of the construction of said line, stations and works, shown, respectively, in column 6 of said schedule, subject to adjustment under paragraph 9, so as to form in thirty years a sinking fund for the retirement of the securities to be issued by the Province of Ontario.

(*e*) To bear its proportionate part of the line loss and pay its proportionate part of the cost to operate, maintain, repair, renew and insure the said line, stations and works, shown respectively in column 7 of said schedule, subject to adjustment under paragraph 9.

(*f*) To keep, observe and perform the covenants, provisos and conditions set forth in said contracts, intended by the Commission and the Company to be kept and observed and performed.

(*g*) To pay as a minimum for three-fourths of the power to be supplied at said date and of the power held in reserve upon any of the said notices, whether the said power is taken or not; and when the greatest amount of power taken for twenty consecutive minutes in any month shall exceed during such twenty minutes three-fourths of the amount to be supplied and held in reserve for pay for this greater amount during that entire month; the amount payable for a month being one-twelfth part of the annual rate applicable to the horse power in question. When the power factor of the greatest amount of power taken for said twenty minutes falls below 90 per cent, the Corporation shall pay for 90 per cent of said power divided by the power factor.

(*h*) To take no more power than the amount to be supplied and held in reserve at said date and upon said notices, as per paragraph 1 (*c*).

(*i*) To use at all times first-class, modern, standard, commercial apparatus and plant to be approved by the Commission.

(*j*) To exercise all due skill and diligence so as to secure the most perfect operation of the plant and apparatus of the Commission and the Company.

3. If, as therein provided, the said contracts are continued until nineteen hundred and forty-two (1942) this agreement shall remain in force until that date.

4. (*a*) Said power shall be three-phase, alternating, commercially continuous twenty-four hour power every day of the year, except as provided in paragraph 6 hereof, and shall be measured by curve-drawing meters, subject to test as to accuracy by either party hereto.

(*b*) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the point of delivery to the Corporation shall constitute the supply and the holding in reserve of all power involved herein, and the fulfilment of all operating obligations hereunder; the amount of the power, its fluctuations, load factor, power factor, distribution as to phases, and all other electric characteristics and qualities being under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The Engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation, and take records at all reasonable times on giving to the Corporation six hours' notice of the intention to make such inspection. The Corporation shall have a like right on giving a like notice to inspect the apparatus, plant and property of the Commission.

6. In case the Commission or the Company shall at any time or times be prevented from supplying said power, or any part thereof, or in case the Corporation shall at any time be prevented from taking said power, or any part thereof, by strike, lockout, riot, fire, invasion, explosion, act of God or the King's enemies, or any other cause reasonably beyond their control, then the Commission shall not be bound to deliver such power during such time, and the Corporation shall not be bound to pay the price of said power at the point of delivery by the Company during such time, but the Corporation shall continue to make all other payment, but as soon as the cause of such interruption is removed the Commission shall without any delay supply such power as aforesaid and the Corporation shall take the same, and each of the parties hereto shall be prompt and diligent in removing and overcoming such cause or causes of interruption.

7. If, and so often as, any interruption shall occur in the service of the Company due to any cause or causes other than those provided for by the next preceding paragraph hereof, the Commission shall pay to the Corporation as liquidated and ascertained damages, and not by way of penalty, their respective proportionate shares of whatever sum is payable to the Commission by reason of such interruption; and when the amount thereof has been settled, such sum may be deducted from any moneys payable by the Corporation to the Commission, but such right of deduction shall not in any case delay the said monthly payments, nor shall the Commission be subject to any other liability for any non-delivery.

8. In case any municipal corporation, or any person, firm or corporation which shall contract with the Commission or with any municipal corporation for a supply of power furnished to the Commission by the Company shall suffer damages by the act or neglect of the Company, and such municipal corporation, person, firm or corporation would, if the Company had made the said contracts directly with them, have had a right to recover such damages or commence any proceedings or any other remedy, the Commission shall be entitled to commence any such proceedings or bring such action for or on behalf of such municipal corporation, person, firm or corporation, and notwithstanding any Statute, decision or rule of law to the contrary, the Commission shall be entitled to all the rights and remedies of such municipal corporation, person, firm or corporation, including the right to recover such damages, but no action shall be brought by the Commission until such municipal corporation, person, firm or corporation shall have agreed with the Commission to pay any costs that may be adjudged to be paid if such proceedings or action is unsuccessful. The rights and remedies of any such municipal corporation, person, firm or corporation shall not be hereby prejudiced.

9. The Commission shall at least annually adjust and apportion the amounts payable by municipal corporations for such power and such interest, sinking fund, line loss, and cost of operating, maintaining, repairing, renewing and insuring the line and works.

10. (*a*) If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation, parties hereto, in writing, of a time and place, and hear all representations that may be made as to the terms and conditions for such supply.

(*b*) Without discrimination in favor of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, parties hereto, appear equitable to the Commission, and approved by the Lieutenant-Governor-in-Council.

(*c*) No such application shall be granted if the said line is not adequate for such supply, or if the supply of the Corporations, parties hereto, will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application, without the written consent of such corporation.

(*d*) In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable to pay for the power so supplied, or otherwise in respect thereof. No power shall be supplied, by any municipal corporation, to any railway or distributing company, without the written consent of the Commission.

11. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation and other municipal corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement, the Commission shall determine and adjust the rights of the Corporation and other municipal corporations, supplied by the Commission, having regard to the amounts paid by them, respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor-in-Council.

12. Each of the Corporations agrees with the other:

(*a*) To take electric power exclusively from the Commission during the continuance of this agreement, subject to the provisos above set forth in paragraph 2 (*b*).

(*b*) To co-operate, by all means in its power, at all times, with the Commission, to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

13. If differences arise between the Corporations the Commission may upon application fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner,

when possible, adjust such difference, and such adjustments shall be final. The Commission shall have all the powers that may be conferred upon a Commission appointed under *The Act respecting Enquiries concerning Public Matters.*

14. This agreement shall extend to, be binding upon and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate Seals and the hands of their proper officers.

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

(Seal.)

(Sgd.) A. BECK,
Chairman Hydro-Electric Power Commission.
(Sgd.) W. W. POPE,
Secretary,
(Sgd.) JOHN S. HENDRIE.

(Sgd.) F. W. ELLIOTT,
Mayor.
(Sgd.) GEO. W. ROOK,
Town Clerk.
(Seal.)

SCHEDULE

Column 1	2	3	4	5	6	7
Name of Municipal Corporation.	Quantity of power applied for in horse-power.	Cost of power at point of delivery to Commission.	No. of Volts.	Estimate maximum cost of power ready for distribution in municipality.	Estimate proportionate part of cost to construct transmission line transformer station and works for nominally h.p. with total capacity of	Estimated proportionate part of line loss and of part cost to operate, maintain, repair, renew and insure transmission line, transformer station works for nominally h.p. with capacity of h.p.
Brockville	1,000		13,200	$24 04	$76,950	$7,077
Prescott	300		13,200	24 54	30,594	1,838

For all power taken up to 2,000 h.p., $14.00 per h.p.
Then for all power taken up to 4,000 h.p., $13.40 per h.p.
" " " " " 6,000 " 12.50 " "
" " " " " 8,000 " 12.00 " "
" " " " " 10,000 " 11.50 " "
" " " " " 10,000 " or over, $11.00 per h.p.

Similar agreements between the Hydro-Electric Power Commission and the Municipal Corporation of the Town of Brockville, the Municipal Corporation of the Village of Winchester and the Municipal Corporation of the Village of Chesterville, otherwise known as Schedules "C," "D" and "E" of this Act have been omitted.

SCHEDULE "F."

This Indenture made in duplicate the 27th day of October, in the year of Our Lord one thousand, nine hundred and thirteen,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Town of Owen Sound, hereinafter called the "Corporation," party of the second part.

Whereas, pursuant to "An Act to provide for the Transmission of Electrical Power to Municipalities," known as *The Power Commission Act* and Amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agree with the Corporation:—

(*a*) To reserve and deliver at the earliest possible date 1,200 h.p. or more of electrical power to the Corporation.

(*b*) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(*c*) To use at all times first-class, modern, standard commercial apparatus and plant and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(*d*) To deliver commercially continuous 24-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreement herein set forth, the Corporation agrees with the Commission:—

(*a*) To use all diligence and every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(*b*) To pay annually interest at 4 per cent to 4½ per cent per annum upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights and acquiring

and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical power or energy to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations and transmission lines, distributing stations and other work necessary for the delivery of the electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations, and other necessary works.

(*c*) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without further notice, discontinue the supply of power to the Corporation until the said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisos and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(*d*) To take electric power exclusively from the Commission during the continuance of this agreement.

(*e*) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

(*f*) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided whether it takes the same or not. When the greatest amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(*g*) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it for twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

(*h*) When the power factor of the greatest amount of power taken for said twenty consecutive minutes falls below 90 per cent the Corporation shall pay for 90 per cent of said power divided by the power factor.

(*i*) To use at all times first-class, modern, standard, commercial apparatus and plant, approved by the Commission.

(*j*) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

(*a*) That the meters with their series and potential transformers shall be connected at the point of delivery.

(*b*) That the maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the substation in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of the power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the municipal corporation or corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and involved corporation or corporations in writing of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favor of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor-in-Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such corporation.

In determining the quantity of power supplied to a municipal corporation the quantity supplied by the Commission within the limits of the corporation to any applicant other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost and there shall be no discrimination as regards price and quantity.

7. It is hereby declared the Commission is to be a trustee of all property held by the Commission under this agreement for the corporation or corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor-in-Council.

8. If differences arise between corporations to which the Commission is supplying power, the Commission may upon application fix a time and place and hear all representations that may be made by the parties and the Commission shall, in a summary manner when possible, adjust such differences and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under *The Act respecting Enquiries Concerning Public Matters.*

9. This agreement shall extend to, be binding upon and inure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seal and the hand of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION.

(Seal.)

(Sgd.) A. Beck.

(Sgd.) W. W. Pope, *Secretary.*

(Seal.)

(Sgd.) E. Limou, *Mayor.*

(Sgd.) Chas. Gordon, *Clerk.*

SCHEDULE G.

This Indenture made in duplicate this Second day of February, in the year of Our Lord, One Thousand Nine Hundred and Fourteen.

Between:

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," Party of the First Part,

and

The Municipal Corporation of the City of Ottawa, hereinafter called the "Corporation," Party of the Second Part.

Whereas, pursuant to "An Act to provide for transmission of electrical power to Municipalities," the Corporation applied to the Commission for a supply of power, and the Commission have entered into a contract with the Ottawa and Hull Power and Manufacturing Company, Limited, and the electors of the Corporation assented to a by-law authorizing the Corporation to enter into a contract with the Commission for such power.

And whereas, in accordance with this Act, the Commission on July 31st, 1907, made a contract with the City of Ottawa for a supply of power from the Ottawa and Hull Power and Manufacturing Company, Limited, and a further agreement for additional power on September 6th, 1910.

And whereas it is the desire of both parties hereto that it be declared that the said agreements of July 31st, 1907, and September 6th, 1910, be terminated and superseded by this agreement as hereinafter set out.

And whereas the Commission has entered into a new agreement with the Ottawa and Hull Power and Manufacturing Company, Limited, hereinafter called the "Company," being dated the 8th day of December, A.D. 1913, for the delivery to the Commission of electric power and energy for the supply of the said Corporation.

And whereas the Corporation has applied to the Commission for a new agreement for a supply of power, in accordance with the agreement between the Commission and the Company dated December 8th, 1913.

1. Now therefore this Indenture witnesseth, that in consideration of the premises and of the agreements of the Corporation herein set forth, subject to the provisions of said Act and of the said contract, the Commission agrees with the Corporation:—

(*a*) To reserve and deliver at the earliest possible date 5,000 h.p. or more of electric power to the Corporation.

(*b*) At the expiration of thirty days' notice in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for in blocks of 500 h.p. each until 20,000 h.p. is being delivered or reserved.

Should any such notices current at any one time, calling for 1,000 h.p. or more, require the installation of additional generating capacity, then the Commission shall not be liable for the non-delivery of such additional power under the notice until six (6) months after the respective dates of such notices. The additional power or such portion thereof as the generating capacity of the Company's plant will permit, will, however, continue to be delivered.

(*c*) To use at all times first-class, modern, standard, commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(*d*) The power shall be delivered to the Corporation at approximately 11,000 volts and at approximately 60 cycles per second.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:—

(*a*) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver the same.

(*b*) Subject to the provisions of paragraph *a* (*f*) hereof to pay to the Commission the following prices:—

$14 per h.p. per annum for all power taken until the amount taken or held in reserve by the Commission from the Company shall equal or exceed 8,000 h.p.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 8,000 h.p., then for each and every horsepower taken by the Corporation, $13.50 per h.p. per annum.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 10,000 h.p., then for each and every horsepower taken by the Corporation, $13 per h.p. per annum.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 12,000 h.p., then for each and every horsepower taken by the Corporation, $12.50 per h.p. per annum.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 14,000 h.p., then for each and every horsepower taken by the Corporation, $12 per h.p. per annum.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 16,000 h.p., then for each and every horsepower taken by the Corporation, $11.50 h.p. per annum.

When the amount taken or held in reserve from the Company by the Commission shall have increased to 18,000 h.p., then for each and every horsepower taken by the Corporation, $11 per h.p. per annum.

(*c*) To pay in addition annually interest at 4 per cent or 4½ per cent per annum upon the moneys expended by the Commission on capital account for the construction of transmission lines, transformer stations and equipment, and other necessary works required for the delivery of power.

Also to pay an annual part of the cost of the construction of the said line, station and works, so as to form in thirty (30) years a sinking fund for the payment of the moneys advanced by the Province of Ontario in connection with this work.

Also to pay the cost of operating, maintaining, repairing, renewing and insuring the said line, station and works.

(*d*) The amounts payable under this contract shall be paid in twelve monthly payments in gold coin of the present standard of weight and fineness, at the office of the Commission at Toronto, and bills shall be rendered by the Commission on or before the fifth day and paid by the Corporation on or before the fifteenth day of each month. If any bill remains unpaid for fifteen days, the Commission may. in addition to all other remedies and without notice. discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisos and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(*e*) To take electric power exclusively from the Commission during the continuance of this agreement.

(*f*) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the greatest amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

If the Corporation during any month takes more than the amount of power ordered and held in reserve for it for twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for and on the part of the Commission to hold in reserve an additional block of power in accordance with the terms and conditions of this contract.

When the power factor of the greatest amount of power taken for said twenty consecutive minutes falls below 90 per cent, the Corporation shall pay ninety per cent. of said power divided by the power factor.

(*g*) To use at all times first-class, modern, standard commercial apparatus and plant approved by the Commission.

(*h*) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and the Corporation.

(*i*) To co-operate by all means in its power, at all times, with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

3. This agreement shall remain in force for ten years from the date of the first delivery of power under this agreement; the Corporation may, at its option, continue this agreement for one or two further successive terms of ten years each.

(*a*) The Corporation may exercise the first of these options by giving notice in writing of its intention to continue this agreement for a further term of ten years at least two years before the expiration of the first term of ten years.

(*b*) The Corporation may exercise the second of these options by giving notice to the Commission in writing of its intention to continue this agreement for the third term of ten years, at least two years before the expiration of the second term of ten years.

4. The power shall be approximately 11,000 volts, 60-cycle, 3-phase, alternating, commercially continuous twenty-four hour power every day in the year except as provided herein. and shall be delivered at the disconnecting switches on the outgoing feeders installed in the Commission's sub-station or on the feeder cables of the Company, within the limits of the municipality.

The Commission shall not be responsible for any failure to deliver power due to the withdrawal or suspension or variation of the necessary permission from the Government of the Dominion of Canada granted the Company to construct and maintain poles, conduits, wires, and other apparatus necessary to transmit and convey the said power, upon any property or structure under the control of the said Government.

(*a*) That the meters with their series or potential transformers may be connected to the high-tension side or low-tension side of the transformers, or some connected to one side and some connected to the other, as the Commission may elect. That whenever connected at other than the point of measurement their readings shall be subject to a correction and shall be corrected to give a reading such as would be obtained by instruments as if connected at the point of measurement. That such corrections shall be based upon tests made upon the step-down transformers and transmission lines by the Commission, or any other tests upon them acceptable to the Commission as to the efficiency, regulation or any other constants of the transformers and transmission lines necessary for said correction, but that such tests, when made by the Commission, are to be made in the presence of the representative or representatives of the Corporation if it so desires.

(*b*) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder; and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

(*c*) The Corporation shall arrange to provide and invest the Company with all the necessary rights, licenses and franchises to enable the Company to construct and maintain poles, conduits, wires and other apparatus necessary to transmit and convey the said power within the limits of the City of Ottawa, to the said point of delivery.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission,

shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. In case the Commission should at any time or times be prevented from supplying said power, or any part thereof, or in case the Corporation shall at any time be prevented from taking said power, or any part thereof, by strike, lock-out, fire, invasion, explosion, act of God, or the King's enemies, or any other cause reasonably beyond their control, then the Commission shall not be bound to deliver such power during such times, and the Corporation shall not be bound to pay the price of said power during such time, but as soon as the cause of such interruption is removed, the Commission shall without any delay supply said power as aforesaid, and the Corporation shall take the same and shall be prompt and diligent in removing and overcoming such cause or causes of interruption.

7. If, and so often as, any interruption shall occur in the service of the Power Company due to any cause or causes other than those provided for by the next preceding paragraph, the Commission shall recover and pay to the Corporation as liquidated and ascertained damages, and not by way of penalty, as follows: for any interruption of less than one hour double the amount payable for power which should have been supplied during the time of such interruption; and for any interruption of one hour or more the amount payable for the power which should have been delivered during the time of such interruption and two times the last mentioned amount in addition thereto, and all moneys payable under this paragraph, when the amount thereof is settled between the Commission and the Company, may be deducted from any money payable by the Corporation to the Commission, but such right of deduction shall not in any case delay the said monthly payments.

8. If at any other time any other municipal corporation, or, pursuant to said Act, any railway or distributing company, or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation in writing of a time and place and hear all representations that may be made as to the terms and conditions for such supply.

Without discriminating in favor of the applicants as to the price to be paid, for equal quantity of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, and are approved by the Leutenant-Governor-in-Council.

No such application shall be granted if the said line is not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such Corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable to pay for the power so supplied, or otherwise in respect thereof. In order to prevent discrimination by the municipal corporation to any railway or distributing company without the written

consent of the Commission, but the Corporation may sell power to any person or persons or manufacturing companies inside the limits of the Corporation, but such power shall not be sold for less than the cost and without discrimination as regards price and quantity.

9. In case any municipal corporation, or any person, firm or corporation which shall contract with the Commission or with any municipal corporation for a supply of power furnished to the Commission by the Power Company shall suffer damages by the act or neglect of the Power Company, and such municipal corporation, person, firm or corporation would, if the Power Company had made the said contracts directly with them, have had a right to recover such damages or commence any proceedings or any other remedy, the Commission shall be entitled to commence any such proceedings or bring such action for or on behalf of such municipal corporation, person, firm or corporation, and notwithstanding any Acts, decision or rule of law to the contrary, the Commission shall be entitled to all the rights and remedies of such municipal corporation, person, firm or corporation, including the right to recover such damages, but no action shall be brought by the Commission until such municipal corporation, person, firm or corporation shall have agreed with the Commission to pay any costs that may be adjudged to be paid if such proceedings or action is unsuccessful. The rights and remedies of any such municipal corporation, person, firm or corporation shall not be hereby prejudiced.

10. The Commission shall annually adjust and apportion the amounts payable by municipal corporations for such power and such interest, sinking fund, line loss, and cost of operating, maintaining, repairing, renewing and insuring the line and works.

11. If differences arise between corporations to whom the Commission is supplying power, the Commission upon application may fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under *The Act respecting Enquiries Concerning Public Matters.*

12. If differences arise between the Corporation and the Commission, the Lieutenant-Governor-in-Council may, upon application, fix a time and place to hear all representations that may be made by the parties, and the Lieutenant-Governor-in-Council shall, in a summary manner, when possible, adjust such differences and such adjustment shall be final. The Lieutenant-Governor-in-Council shall have all the powers that may be conferred upon a Commissioner appointed under *The Act respecting Enquiries Concerning Public Matters.*

13. And it is hereby declared that the Commission is to be a trustee of all properties held by the Commission under this agreement for the corporations and other municipal corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the corporations and other municipal corporations, supplied by the Commission, having regard to the amounts paid by them respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor-in-Council.

14. And it is hereby understood and agreed that the said agreements of 31st July, 1907, and the further agreement of September 6th, 1910, between the parties hereto shall be terminated and superseded by this agreement on the date of the first delivery of power to the Commission by the Company, under the new agreement between the Commission and the Company dated the 8th day of December. 1913.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

Signed, sealed and delivered
in the presence of

(Sgd.) Reginald H. Doe.

HYDRO-ELECTRIC POWER COMMISSION,

(Sgd.) A. Beck, (Seal.)

(Sgd.) W. K. McNaught,

CORPORATION OF THE CITY OF OTTAWA.

(Sgd.) Taylor McVeity,
Mayor.

(Sgd.) John Henderson,
City Clerk.

(Seal.)

SCHEDULE "H."

BY-LAW No. 1353.

A by-law to provide for the issue of debentures to the extent of $100,000 for the cost of a plant to distribute electric power to be supplied by the Hydro-Electric Power Commission of Ontario from Niagara Falls.

Provisionally adopted on the 25th of May, 1910.

Passed the 4th day of July, 1910, all the members voting in favor of the third reading.

Whereas it is necessary to raise by way of loan on the credit of the city the sum of one hundred thousand dollars ($100,000) to provide for the cost of works, plant, machinery and appliances necessary for the distribution of electric power in the City of Windsor and in the neighborhood thereof to be supplied by the Hydro-Electric Power Commission of Ontario from Niagara Falls and to provide for the expense of discount and other charges of negotiating the said loan;

And whereas the amount of the whole rateable property of the City of Windsor according to the last revised assessment roll thereof is $10,010,675;

And whereas the existing debenture debt of the City of Windsor is $564,905.60, exclusive of local improvements secured by special rates of assessment;

And whereas the sum of $100,000 is the debt intended to be created by this by-law;

And whereas it will require the sum of $5,783.01 to be raised annually for the period of thirty years by a special rate sufficient therefor on all the rateable property in the City of Windsor;

Therefore the Council of the Corporation of the City of Windsor enacts as follows:—

1. It shall be lawful for the mayor of the City of Windsor and the treasurer thereof to raise by way of loan, upon the security of the debentures hereinafter mentioned, from any person or persons, body or bodies corporate who may be willing to advance the same upon the credit of such debentures, a sum of money not exceeding the whole sum of $100,000, and to cause the same to be paid into the hands of the city treasurer for the purposes and with the objects above recited.

2. It shall be lawful for the said mayor and treasurer to cause any number of debentures to be made for such sums of money as may be required for the purposes aforesaid, either in currency or sterling money, payable in gold coin, for not less than one hundred dollars currency or twenty pounds sterling each, and not exceeding in the whole the sum of one hundred thousand dollars ($100,000), and the said debentures shall be sealed with the seal of the corporation and be signed by the mayor and treasurer, and be payable at the office of said treasurer in said city.

NOTE.—*The paragraph numbered 3 in the by-law as originally passed is as follows:*—

3. The said debentures shall bear date the 22nd day of June, 1910, and shall be payable on the 20th day of June of each year thereafter for and during the said period of 30 years, and be for the respective amount following, that is to say:—

One debenture	for the sum of	$1,783.01,	payable in the year	1911
"	"	1,854.33,	"	1912
"	"	1,928.50,	"	1913
"	"	2,005.64,	"	1914
"	"	2,085.87,	"	1915
"	"	2,169.30,	"	1916
"	"	2,256.08,	"	1917
"	"	2,346.32,	"	1918
"	"	2,440.17,	"	1919
"	"	2,537.78,	"	1920
"	"	2,639.29,	"	1921
"	"	2,744.86,	"	1922
"	"	2,854.66,	"	1923
"	"	2,968.84,	"	1924
"	"	3,087.60,	"	1925
"	"	3,211.10,	"	1926
"	"	3,339.54,	"	1927
"	"	3,473.13,	"	1928
"	"	3,612.05	"	1929
"	"	3,756.53,	"	1930
"	"	3,906.79,	"	1931
"	"	4,063.07,	"	1932
"	"	4,225.59,	"	1933
"	"	4.394.61,	"	1934
"	"	4,570.40,	"	1935
"	"	4,753.21,	"	1936
"	"	4,943.34,	"	1937
"	"	5,141.08,	"	1938
"	"	5,346.72,	"	1939
"	"	5,560.59,	"	1940

AGREEMENTS

During the fiscal year agreements for a supply of power have been made with the Municipalities of Ayr, Bolton, Creemore, Dresden, Drumbo, Elora, Embro, Fergus, Granthan Township, Lucan, New Toronto, Ottawa, Plattsville, Princeton, Simcoe, St. Catharines, Strathroy, Streetsville, Tay Township, Tilbury, Walkerville, Wallaceburg, Waterford and Woodbridge.

The new agreement with the City of Ottawa was necessary, as they were using up to the full quantity of power called for in their former agreement and a new contract was necessary. This also necessitated the making of a new contract with the Ottawa and Hull Power and Manufacturing Company, a copy of which is set out below. The agreement with the City of Ottawa is set out in the Power Commission Act of 1914.

Herewith copy of contract with Ottawa and Hull Power and Manufacturing Co. attached.

THIS AGREEMENT dated the 8th day of December, 1913 A.D.

BETWEEN:

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO acting herein on its own behalf and with the approval of the Lieutenant-Governor-in-Council, herein called the "Commission,"

Party of the First Part,

—and—

THE OTTAWA AND HULL POWER AND MANUFACTURING COMPANY, herein called the "Company."

Party of the Second Part.

WHEREAS, by the Power Commission Act passed by the Legislature of the Province of Ontario in the seventh year of the reign of His Majesty King Edward VII, and Chaptered 19, it was, amongst other things, enacted that any Municipal Corporation might apply to the Hydro-Electric Power Commission of Ontario for the transmission to such Corporation of electrical power and energy for the uses of the Corporation and the inhabitants thereof, for lighting, heating and power purposes.

AND WHEREAS, in accordance with this Act, the Commission on the 31st day of July, A.D. 1907, made a contract with the Company for a supply of power for the City of Ottawa, and a further agreement on the 6th day of December, A.D. 1910.

AND WHEREAS it is the desire of both parties thereto that it be declared that the said agreements of July 31st, 1907, and December 6th, 1910, be terminated and superseded by this agreement.

AND WHEREAS, certain Municipalities have applied to the Commission for a maximum price for such power, and for estimates on the cost of transmission to such Municipalities.

AND WHEREAS, the said estimates will be based in part upon this agreement and the Commission will be required to devote time and skill and expend moneys in preparation of such estimates, and such estimates are to be used for the purpose set forth in the said Power Commission Act and amendments thereto.

NOW THEREFORE THIS INDENTURE WITNESSETH that in consideration of the premises and of the mutual covenants and agreements herein, each of the said parties hereto agrees with the other as follows:—

1. The Company hereby agrees:—

(*a*) At the expiration of thirty (30) days' notice in writing from the Commission to the Company, to reserve and deliver when called for 5,000 horse power of electrical power to the Commission. Said notice shall be given not later than 1st January, 1914.

(*b*) At the expiration of thirty (30) days' notice in writing which may be given from time to time during the continuance of this agreement, to reserve and deliver to the Commission, additional electric power when called from time to time, in blocks of 500 horse power each, until the total amount so reserved and delivered, including hte said 5,000 h.p. shall amount to 20,000 horse power.

Should any such notices current at one time, calling for 1,000 horse power or more require the installation of additional generating capacity, then the Company shall not be liable for the non-delivery of such additional power under the notice, until six (6) months after the respective dates of such notices. The Company shall, however, continue to deliver the additional power or such portion thereof, as the capacity of its plant will permit.

(*c*) Save as hereinafter provided the Commission shall not be bound to take or pay for any additional electric power until notice shall have been given as above provided.

2. The Company hereby agrees to reserve and deliver and the Commission agrees to purchase and pay for the said electric power on the terms and conditions of this agreement.

3. The Commission agrees:—

To pay the Company for such power reserved or taken under this agreement, subject to the conditions or paragraph No. 4 and all other conditions of this agreement as set forth hereafter, it being understood and agreed that the power to be delivered shall refer to 11,000 volt power as required by the Commission from time to time, delivered as set forth in Paragraph No. 5 hereunder.

For 5,000 horse power taken or held in reserve, $14.00 per horse power per annum.

When the amount taken or held in reserve shall have increased to 8,000 horse power, then for each and every horse power taken $13.50 per horse power per annum.

When the amount taken or held in reserve shall have increased to 16,000 horse power, then for each and every horse power taken $13.00 per horse power per annum.

When the amount taken or held in reserve shall have increased to 12,000 horse power, then for each and every horse power taken $12.50 per horse power per annum.

When the amount taken or held in reserve shall have increased to 14,000 horse power, then for each and every horse power taken $12.00 per horse power per annum.

When the amount taken or held in reserve shall have increased to 16,000 horse power, then for each and every horse power taken $11.50 per horse power per annum.

When the amount taken or held in reserve shall have increased to 16,000 horse power, then for each and every horse power taken $11.00 per horse power per annum.

4. The Commission shall pay for three-fourths of the power ordered from time to time by the Commission and held in reserve for it as herein provided, whether it takes the same or not. When the greatest amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes, three-fourths of the amount ordered by the Commission and held in reserve, then the Commission shall pay for this greatest amount during the entire month.

If the Commission during any month takes more than the amount of power ordered and held in reserve for it for twenty (20) consecutive minutes, the Commission shall pay for this greatest amount of power during the entire month. The taking of such excess shall thereafter constitute an obligation on the part of the Commission to pay for, and on the part of the Company to hold in reserve, one or more additional blocks of 500 h.p. in accordance with the terms and conditions of this contract.

When the power factor of the greatest amount of power taken for the twenty (20) consecutive minutes during the entire month falls below 90 per cent, the Commission shall pay for 90 per cent of the said power, divided by the power factor.

A composite daily curve, derived from daily load curves taken at the point of measurement in accordance with the method specified in Paragraph II, shall be compiled each month by the Commission, and these composite curves shall be used as a basis of payment for power during the month to which they apply.

The power shall be paid for monthly in gold coin of the present standard weight and fineness, twelve amounts in each year. The composite curve shall be forwarded to the Company by the fifth day of the succeeding month, and bills shall be rendered by the Company on the tenth day and paid by the Commission on or before the twentieth day of each month.

5. Under this agreement the point of delivery of power by the Company to the Commission shall be the terminals of the 11,000 volt disconnecting switches on the incoming lines on the property of the Commission or of the City of Ottawa, located within the limits of the said city and at a distance not greater than 1,000 feet from the Ontario shore of the Ottawa River, at or near Chaudiere Bridge.

The Commission shall arrange to provide and invest the Company with all the necessary rights, licenses and franchises, to enable the Company to construct and maintain poles, conduits, wires and other apparatus necessary to transmit and convey the said power within the limits of the City of Ottawa, to the said point of delivery. The Company shall not be responsible for any failure to deliver power due to the withdrawal or suspension or variation of the necessary permission from the Government of the Dominion of Canada to construct and maintain such poles, conduits, wires and other apparatus, upon any property under the control of the said Government.

6. This agreement shall remain in force for thirteen (13) years from the date of the expiration of the said first notice of thirty days. The Commission may at its option continue this agreement for one or two further consecutive terms of ten years each. The Commission may exercise the first of these options by first giving notice in writing of its intention to continue this agreement for the further term of ten years at least two years before the expiration of the first term of thirteen years, and if, pursuant to such notice, this agreement is continued beyond the said term of ten years, the Commission may exercise the second of these options by giving notice in writing of its intention to continue this agreement for the second term of ten years, at least two years before the expiration of the said first term of ten years.

7. The electric power herein contracted for shall be three phase, alternating, commercially continuous, twenty-four hour power every day in the year, except as provided in Paragraph 12 hereof.

8. It is agreed that maintenance by the Company of the agreed voltage at the agreed frequency subject to the variation mentioned in Clause 9 at the point of delivery, having regard to the distance of such point from the point of generation, shall constitute the delivery of all power involved herein and the fulfilment of all operating obligations hereunder, and that when voltage and frequency are so maintained, the amount of power, its fluctuations, load power, power factor, distribution as to phases, and all other electric characteristics and qualities are under the sole control of the Commission, its agents, customers, apparatus, appliance and circuits.

9. The Company shall at all times use first-class modern, standard, commercial Hydro-Electric power apparatus and plant, and the power shall be delivered at approximately 60 cycles per second and at approximately 11,000 volts. The Company shall use first-class, modern, standard, regulating apparatus and all due skill and diligence to maintain the power at such voltage and frequency. The maximum allowable variation at the power house under normal operating conditions shall be 2½ per cent above or below frequency and voltage herein specified. The Company shall use all due diligence to prevent greater variations than above provided for, caused by temporary abnormal conditions, and the Company shall not be in any way liable if such due diligence is used.

The Commission and its customers shall select and use transformers and all apparatus most suitable to receive the electric power produced by the apparatus of the Company, and the Commission's transmitting, transforming, translating, and all other apparatus and devices upon its circuits when receiving power from the Company shall be of modern standard design and construction, and shall be operated and maintained with special reference to securing the highest efficiency and most perfect operation consistent with commercial practice, not only of its own, but also of the apparatus of the Company when receiving power from the Company, and the Commission shall install upon and equip all circuits with such modern and approved protective devices as are necessary to afford the same measure of protection provided by the Company for its own circuits.

10. The power herein provided for shall be measured by suitable curve drawing meters, which shall be subject to tests as to accuracy by either party hereto. No allowance shall be made for loss in power transmission between the Company's power house and the said point of delivery. These meters shall be furnished and installed by the Company on the outgoing feeders in the power house of the Company. The Commis-

sion shall have the right to install instruments in the said power house to check the records of the Company's meters. The Company shall provide a suitable place in the power house for the proper installation of the above mentioned instruments and other such measuring apparatus as the Commission may deem necessary.

11. The Engineers of the Commission or one or more of them or any other person or persons appointed for this purpose by the Commission shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Company and take records at all reasonable hours. If in the opinion of the Commission any such apparatus, device, wiring, plant or property is defective or is liable to cause interruption or trouble to or in connection with the supply of the said power, then the Company shall forthwith on request by the Commission's Engineer make such changes at the expense of the Company as may be required by the said Engineer. In the event of non-compliance by the Company with any requirement of the Commission, under this paragraph, thee Commission may, at its discretion, after notice has been given in writing, proceed to make such changes in accordance with the recommendation of said Engineer, and a sufficient sum to cover all costs in connection therewith shall be deducted from any moneys payable by the Commission to the Company under this agreement. Nothing contained in this paragraph shall limit or impair the rights of the Company to seek redress under Paragraph 17 hereof.

12. In case the Company shall at any time be prevented from delivering said power, or any part thereof, or in case the Commission shall at any time be prevented from taking the said power or any part thereof, by strike, lockout, riot, invasion, explosion, act of God, or the King's enemies, or any other cause reasonably beyond their control, then the Company shall not be bound to deliver such power during such time and the Commission shall not be bound to pay for such power during such time, but as soon as the cause of such interruption is removed, the Company shall, without any delay, deliver the said power as aforesaid and the Commission shall take the same and each of the parties hereto shall be prompt and diligent in removing and overcoming such causes of interruption.

13. In case the plant, apparatus, building or premises of the Company or any part thereof shall at any time during the continuance of this agreement be damaged or destroyed so as to prevent the Company from supplying the said power of the quantity hereinbefore provided for to the Commission, the Company shall use its best endeavor to procure the said supply of power for the Commission otherwise or elsewhere, and if the Company fails or neglects to procure such power for the Commission, then the Commission may with the approval of the Lieutenant-Governor-in-Council procure such power at reasonable rates and charge the same to the Company, and if the said power cannot be procured either by the Company or the Commission then the Commission may, with the approval of the Lieutenant-Governor-in-Council, terminate this agreement.

14. After the happenings of any of the events provided for in Paragraphs 12 and 13 hereof, power shall be delivered first for delivery to public utilities, whether the same are being supplied by the Commission or directly by the Company, said delivery to be *pro rata*, first for waterworks service, second for lighting, and third for railway service, after which power shall be delivered *pro rata* to the Commission and other customers of the Company.

15. If and so often as any interruption shall occur in the service of the Company due to any cause or causes other than those provided for by Paragraphs 12 and 13

hereof, the Company shall pay to the Commission as liquidated and ascertained damages, and not by way of penalty as follows:—

For any interruptions less than one hour double the amount payable for power which should have been delivered during the time of such interruption, and for any interruption of one hour or more the amount payable for the power which should have been delivered during the time of such interruption, and six times the last mentioned amount in addition thereto, and all moneys payable under this paragraph when the amount hereof is settled between the parties may be deducted from the moneys payable by the Commission to the Company under this agreement.

16. It is recognized by both the parties hereto that the state of the art of production, transmission and application of electrical energy is subject to constant advance. and that it is impossible by contract to cover all the requirements and conditions which time may develop, the Company and the Commission, with the approval of the Lieutenant-Governor-in-Council while adhering to the provisions of this agreement will at any time upon request of the other, take up and in good faith fairly consider, with the aid of the respective engineers, any feature of changes of the system as a whole or any modifications of any of the provisions hereof, provided it shall appear to the party to whom such request is made that compliance therewith shall tend to make this agreement more effective and to make the venture of each party more successful and certain, provided, however, that any such action or the failure on the part of either party to require of the exact conformity to the provisions of this agreement or any liberty or greater latitude beyond the provisions of this agreement allowed by either party to the other in course of the co-operation implied by the spirit of this agreement shall in no manner operate as or constitute a precedent or amend or change the obligations of the parties thereto.

17. It is agreed that in case any dispute shall arise relating to the question of the performance and fulfillment of any of the terms, provisoes or conditions of this agreement, or as to the method of accuracy of the measurement of the power, or as to any question which may arise under this agreement, the same shall be determined by two independent persons, one to be chosen by each of the parties of such dispute, and such persons before proceeding with the reference, shall appoint a third arbitrator to act with them, and the decision of the said three arbitrators or a majority of them shall be conclusive on both parties, except as hereinafter provided, and in case either of the said parties shall neglect or fail to appoint an arbitrator within thirty days after the request in writing by the other party then the arbitrator appointed by the other party may proceed alone and his award shall be conclusive on both parties except as hereinafter provided. The award shall be made within four months after the appointment of the first of such arbitrators, and in the event of the arbitrators appointed as aforesaid being unable or unwilling to agree upon a third arbitrator within two weeks after their appointment or the appointment of the one of them who was the last appointed, then such third arbitrator shall be chosen and appointed by the Chief Justice of Ontario, for the time being, or in the event of the said Chief Justice being ill, deceased, absent from the Province or otherwise unable or refusing to act, then such third arbitrator shall be appointed by any Judge of the Supreme Court of Judicature. It is agreed that there may be an appeal by either party from any decision or award of such arbitrators to the Supreme Court of Judicature in accordance with the provisions of the Arbitration Act in that behalf. No such appeal shall be carried beyond the decision of the Appellate Division for Ontario.

18. In case any Municipal Corporation which shall contract with the Commission for a supply of power or any person, firm or corporation, which shall contract with

any such municipal corporation or with the Commission for a supply of power furnished to the Commission by the Company, and such Municipal corporation, firm, person or Corporation would if the Company had made this contract directly with them, have had a right to recover such damages or commence any proceedings or any other remedy, the Commission shall be entitled to commence any such proceedings or bring action for or on behalf of such municipal corporation, person, firm or corporation and notwithstanding acts, decision or rule of law to the contrary the Commission shall be entitled to all the rights and remedies of such municipal corporation, person, firm or corporation, including the right to recover such damages, but no action shall be brought by the Commission until such municipal corporation, firm, person or corporation shall have agreed with the Commission to pay any costs that may be adjudged to be paid if such proceedings or action is unsuccessful. The rights and remedies of any such municipal corporation, person, firm or corporation shall not be hereby prejudiced.

19. Subject to the provisions of paragraph 13 of this Agreement, notwithstanding there may be difference between the parties hereto as to the supply or sufficiency of the said power, or the payment thereof, or any other questions whatsoever which may arise under this agreement, the Company shall continue to deliver and the Commission to pay therefor, and both parties shall continue to carry out the contract notwithstanding such differences and when the matters which may be so in issue shall be finally determined by the reference to arbitration in the manner provided by Paragraph 17 hereof, the parties shall deal with such matters according to the terms of the award which may be made upon such reference. It being the distinct agreement between the parties that there shall not be during the period of this agreement any stoppage or cessation in the supply of the said power or the payments therefor, but that the same shall be continued as if there was no such difference.

20. During the period of this Agreement, or extension thereof, the Company shall not directly or indirectly supply power to any municipality or person, firm or corporation therein, while such municipality, person, firm or corporation therein is supplied by the Commission, nor shall the Commission purchase or supply power from any other source than the Company to be used within a radius of five miles of the Company's Power House or within the limits of the City of Ottawa, or the suburbs thereof as now or hereafter may be established, except in the event of the Company not having power available to meet the requirements on notice of the Commission.

21. Notwithstanding anything hereinbefore contained this Agreement shall not come into operation until in addition to any other Order-in-Council, pursuant to said Act, an Order-in-Council has been passed and approved by the Lieutenant-Governor-in-Council expressly declaring that this Agreement shall from the date of such Order-in-Council be binding upon the Commission, but this shall in no way interfere with the Agreement contained in Paragraph 3 (*a*) and the Commission undertakes to do all things lawful in its power that may be needed to bring this Agreement into operation at as early a date as possible, and to procure the assent and declaration of the said Lieutenant-Governor-in-Council above referred to, and the said Company agrees to co-operate with the Commission by all means in its power to carry out the object of this Agreement.

22. AND IT IS HEREBY UNDERSTOOD AND AGREED that the said Agreement of 31st of July, 1907, and the further agreement of December 6th, 1910, between the parties hereto shall be terminated and superseded by this Agreement upon the expiration of the notice to be given pursuant to Clause 1 (*a*) hereof.

23. This Agreement shall extend to and be binding upon and enure to the benefit of the successors and assigns of the parties hereto.

IN WITNESS WHEREOF the Commission and the Company have respectively affixed their Corporate Seals and the hands of their proper officers.

SIGNED, SEALED AND DELIVERED
In the presence of:

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

(Sgd.) A. BECK,
Chairman.

(Sgd.) W. K. MCNAUGHT.

(Sgd.) W. W. POPE,
Secretary.

(Sgd.) H. S. HARRISON.

THE OTTAWA AND HULL POWER AND MF'G. CO., LTD.
(Sgd.) WM. C. EDWARDS,
President.

(Sgd.) R. BLACKBURN,
Sec.-Treas.

(Seal.) Ottawa and Hull Power and M'fg. Co., Ltd.
(Seal.) Hydro-Electric Power Commission of Ontario.

RIGHT-OF-WAY

High-Tension Lines

During the past year the right-of-way from Windsor to St. Thomas was practically completed. There are very few outstanding cases where the owner and the Commission have been unable to agree as to price. On completion of this section, the right of way staff, which consisted of a Chief Agent and four assistants was reduced to the Chief Agent and two assistants. It might be mentioned that in all the dealings on this section of the line, litigation has been absolutely avoided, neither have there been any arbitrations, which fact speaks for itself as to the manner in which the owners have been dealt with.

Owing to the rapid increase in the consumption of power by the municipalities, it was found necessary to duplicate the transmission line from Niagara Falls to Dundas, a distance of 50.02 miles. This was also found necessary owing to the fact that this is the main trunk line of the whole system, and the Commission felt it wise to minimize the danger of interruptions to the service. It was decided to purchase a 66 ft. strip of right-of-way on the same plan as that followed on the Windsor line, i.e., the land to be purchased outright and not on the easement plan. Some 250 owners had to be dealt with, all of which is proceeding satisfactorily. The original line between Niagara Falls and Dundas was run along the roads and the fronts of the farms and was purchased on the easements plan. In the case of this duplicate line, however, the towers were located at the back of the farms and the land was purchased outright. The office at St. Thomas was closed and one opened at St. Catharines, in order that the work might be facilitated.

Low-Tension Lines

During the past year approximately 260 miles of low-tension wood pole lines have been constructed, about 245 miles in the Niagara District and 15 miles in the eastern section of the Province. The right-of-way department has been engaged continuously in this connection, arranging pole and tree trimming rights, etc. These lines are purchased on the 30 year easement plan. Some 700 farmers have been dealt with, agreements taken and the consideration paid, all without litigation or arbitration. It is also necessary in many cases to obtain highway rights from the various Township Councils, all of whom have shown a willingness to assist the work of the Commission in every way.

CROSSINGS

During the past year it was found necessary to secure permission from the various steam and electric railway, telephone and telegraph companies and power companies, for the crossing of their lines by the various high and low-tension wires of the Commission. There were approximately 210 low-tension crossings and 200 high-tension crossings, all of which necessitated applications and blue prints being forwarded to the interested parties, and where they did not agree, to the Railway Board at Ottawa. The correspondence in this connection was exceptionally heavy, owing to the various demands made by the Railway Companies. In the few cases brought before the Board of Railway Commissioners, the Commission's plans were approved and the crossing ordered.

PURCHASE OF SYSTEMS

The past year was noteworthy for the fact that the Commission for the first time in its history became a producer of power, in addition to transmitting it, having purchased a site and developed power at Wasdell's Falls for the supply of the Beaverton-Canning district, and in order to supply Owen Sound and the surrounding district negotiations were entered into for the purchase of the plant of the Georgian Bay Power Company located at Eugenia Falls. It required considerable time to deal with the various bondholders, etc., and several meetings were held. However, the deal was finally closed and the plant taken over. The right-of-way department also arranged for the purchase of some 2,000 acres of land for flooding rights and additional land for a pipe line and site for a new power house.

The Commission also closed for the purchase of the plant of the Simcoe Railway and Power Company located at the Big Chute on the Severn River. After protracted negotiations, this matter was also completed. This plant is for the supply of Collingwood, Barrie. Midland, Penetanguishene and the surrounding district.

In connection with the Eugenia Falls proposition, it became necessary to close a number of roads through the Township of Artemesia, which was taken up with the Township Council and various owners and arrangements satisfactorily concluded.

RADIAL RAILWAYS

In accordance with the provisions of the Act the Municipalities of the Townships of Scarborough, Markham, Whitchurch, Pickering, Uxbridge, Whitby, Reach. the Towns of Newmarket, Uxbridge, Whitby, the Villages of Markham, Stouffville and Port Perry, took this question up actively, a number of meetings were held. and by-laws and contracts drafted and forwarded to the various municipalities for submission to the electors.

METER INSPECTION

A number of complaints having been received from the various Municipalities as to the charges for meter inspection by the Dominion Government, this matter was actively taken up with the Minister of Inland Revenue with the request that they either abolish or lower the rates for inspecting meters. No action has been taken as yet, but results are expected in the near future.

NEW OFFICE BUILDING

Owing to the rapid increase in the staff of the Commission, it was found that the present quarters were too congested, and the Board decided that an office building be erected. Various sites were examined and a number of offers considered. It was finally decided to build on University Avenue, and the deal was closed for part of the old Caer Howell property, during the latter part of the fiscal year.

During the past year, the Commission purchased from the Ontario Power Company the distribution systems and transformer stations in the Towns of Welland and St. Catharines. Titles were carefully searched. the transactions completed and the plants then turned over to the Towns to be operated by them.

The services of the Commission were called upon in some cases to adjust the rates of pay for employees of different systems in the various municipalities. Hearings were given and decisions made, all of which have proved eminently satisfactory to both parties.

SECTION II

TRANSMISSION SYSTEM

STEEL TOWER TRANSMISSION LINES

Surveys

Surveys completed during the fiscal year of 1914 were for the Niagara Duplication Line, from Niagara Falls to Dundas, and the Dundas-Hamilton Steel Pole Line. The former survey was begun in January, 1914, and completed, including the staking of towers and telephone line, in September. The Dundas-Hamilton line survey was commenced in September, 1914, and carried on at intervals to completion in October.

Niagara Duplication Route

Commencing at the Niagara Transformer Station, Lot 159, Township of Stamford, this line runs almost due west through the Townships of Stamford, Thorold, Pelham and Gainsboro to the Gainsboro-Caistor Township line a distance of 25.8 miles. In this section are crossed the Welland Canal, the Wabash and Welland Divisions of the Grand Trunk Railway, the Niagara and St. Catharines Electric Railway, the Toronto, Hamilton and Buffalo Railways, main line, the Dunnville, Beamsville and Welland Port and the Dunnville, Smithville Branch of the Toronto, Hamilton and Buffalo Railway, and the Ontario Power Co. and Toronto Power Co. lines in several places. At all of these points special construction is necessary to give the required clearances over all foreign lines.

At the Gainsboro-Caistor Township line, the line deflects to the right and runs in a northwesterly direction, approximately, along the centre line of Concession 6, Township of Caistor, a distance of 7.4 miles to the Caistor-Binbrook Township line, where it deflects one degree to the right and runs diagonally across the Townships of Binbrook and Glanford, a distance of 11.9 miles, to the Glanford-Ancaster township line. In this section the Grand Trunk Railway is crossed at a point about three miles south of Rymal.

At the Glanford-Ancaster Township line, the line deflects to the right and runs in a northerly direction through the Townships of Ancaster and West Flamboro, a distance of 4.93 miles to the Dundas Interswitching Station, Lot. 19, Concession 1, Township of West Flamboro. In this section the Hamilton-Brantford Electric Ry., the Hamilton-Dundas Electric Ry. and the Cataract Power Company high-tension line are crossed, necessitating special construction in each case.

The total length of this line is 50.03 miles.

Dundas-Hamilton Route

Commencing at the Dundas Interswitching Station the line runs southerly a distance of 1 mile to the intersection of Fifth Avenue of the McKittrick Survey; it then deflects to the east along Fifth Avenue a distance of 1.08 miles to the intersection of Paradise Road, Hamilton, and turning north follows this road a distance of .2 miles to Hunt Street, Hamilton, where it again deflects to the east along Hunt Street, a distance of .52 miles to the Dundern Transformer Station, Hamilton, the total length of the line being 2.8 miles.

Contracts for Material

NIAGARA DUPLICATION

On this line it was decided to use tandem steel tower construction similar to the Windsor line. No. 4/0 B. & S. gauge copper cable was specified for conductors and a standard span of 630 feet between conductor supports adopted.

Tenders were asked for the supply of the different kinds of transmission line material required and contracts were let to the following companies:

The Canadian Bridge Co., of Walkerville, for the supply of steel towers and footings.

The Galt Malleable Iron Co., for the supply of malleable iron clamps and yokes.

The Canadian Porcelain Co., of Hamilton, for the supply of Suspension Insulators.

The Ohio Brass Co., of Mansfield, Ohio, for the supply of Strain Insulators.

The Steel Company of Canada, Montreal, for the supply of 5/16 in. galvanized steel ground cable.

The Canada Wire and Cable Co., of Toronto, and the Northern Electric Co., of Toronto, the supply of No. 4/0 B. & S. gauge copper cable.

The Telephone line material was taken from the Commission's stores.

Organization

WINDSOR EXTENSION

The field organization was the same in 1914 as in 1913, and consisted of tower footing, tower assembling, tower erection, right-of-way clearing, fence and bridge gangs, on the transmission line, and digging, pole erection and stringing gangs on the telephone line. Early in March, 1914, insulator and cable erection gangs were added to the organization.

NIAGARA DUPLICATION

The organization for the Niagara Duplication was practically the same as for Windsor Extension, each gang as it finished work on the latter being transferred to the former line. The field headquarters were transferred from Chatham to Hamilton in June.

Material Erected on Windsor Extension

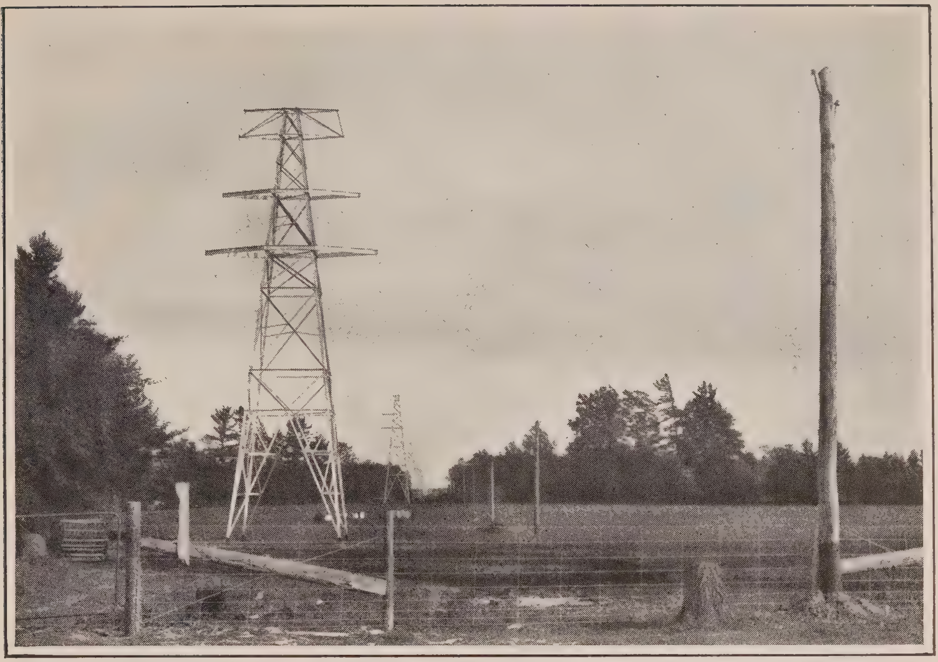
TRANSMISSION LINE

Steel Towers

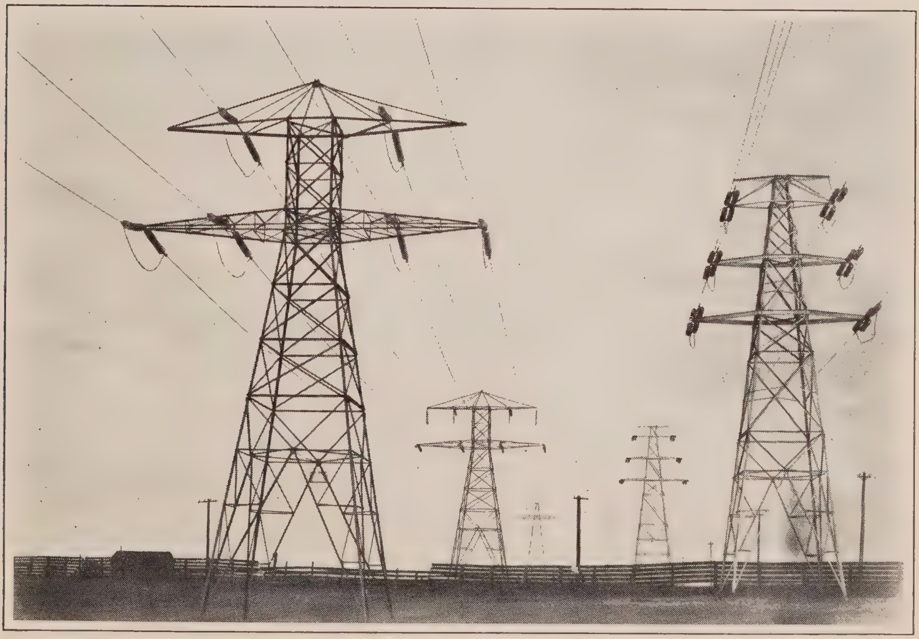
Kind of material	No.	Unit Weight Lb.	Total Weight Lb.
Standard Footings	727	723.6	526,066
Anchor Footings	133	1,486.8	197,743
Standard Towers	727	4,717	3,429,131
Anchor Towers	118	5,940	700,955
Transposition Towers	15	6,527	97,905
Grand Total Weight			4,951,800 lb.

Cable

Kind	Weight in Lb.
No. 3/0 B. & S. Gauge Copper	1,715,489
5/16 in. Ground Wire	234,340



Standard Transmission Tower Section "A-A"



Transmission Line Crossing—Allanburg

Insulators

Location	No. Suspension Units	No. Strain Units
On Standard Towers	34,698	....
On Anchor Towers	3,504	9,720
On Transposition Towers	720	3,240
Totals	38,922	12,960

Small Hardware

Kind	Number
Strain Clamps	720
Suspension Clamps	4,890
Yokes	1,440
Double Ball Forgings	2,160
Standard Eyebolts	6,522
Hooks	528
Strain Shims	720
Suspension Shims	4,890
No. 3/0 B. & S. Gauge Copper Sleeves	1,545
Parallel Groove Clamps	720
Copper Sleeves for 5/16 in. Ground Wire	400

TELEPHONE LINE

No. 9 B. & S. Gauge Hard Drawn Copper (Wire Miles)	433
No. 9 B. & S. Gauge Soft Copper Tie Wire (Wire Miles)	6
Cedar Poles	4,227

Material to be Used on Niagara Duplication

TRANSMISSION LINE

Steel Towers

Kind	No.	Unit Wt., Lb.	Total Wt., Lb.
Standard footings, Windsor Type	322	709.3	228,417
Standard footings, Niagara Type	48	777.2	37,305
L. A. footings, Windsor Type	30	1,492	44,755
H. A. footings, Windsor Type	12	1,492	17,904
H. A. footings, Niagara Type	29	847	24,563
12 ft. Extension Anchor Footings	6	847	5,082
28 ft. Extension Anchor Footings	2	847	1,694
Welland Canal, Anchor Footings	2	19.387	38,774
Standard Towers, Windsor Type	220	4,689.4	1,031,677
Standard Towers, Niagara Type	149	4,896.6	729,589
Line Anchor Towers, Windsor Type	7	6,199	43,390
Line Anchor Towers, Niagara Type	23	6,020	138,455
Heavy Anchor Towers, Niagara Type	32	6,761	216,352
Heavy Anchor Transposition	7	7,720	54,040
12 ft. Extension Tower	5	8,066	40,330
12 ft. Extension Transposition	1	8,869	8,869
28 ft. Extension Tower	1	10,554	10,554
28 ft. Extension Transposition	1	11,358	11,358
Welland Canal Towers	2	55.720	111,441
Special 8 ft. 6 in. Extension Standard	1	6,296.6	6,297
Special 8 ft. 6 in. Extension Anchor	2	9,530	19,060
Grand Total Weight			2,819,906

Cable

No. 4/0 B. & S. Gauge Copper Cable	1,076,693 lb.
5/16 in. Ground Wire	97,213 lb.

Insulators

Location	No. Suspension Units	No. Strain Units
On Standard Towers	17,760	....
On Anchor Towers	1,440	9,768
On Transposition Towers	432	2,160
Totals	19,632	11,928

Small Hardware

Kind	Number
Strain Clamps	624
Suspension Clamps	2,448
Yokes	1,224
Double Ball Forgings	1,836
Standard Eye Bolts	2,844
Hooks	228
Strain Shims	624
Suspension Shims	2,448
No. 3/0 B. & S. Gauge Copper Sleeves	775
Parallel Groove Clamps	600
Copper Sleeves for 5/16 in. Ground Wire	150

TELEPHONE LINE

No. 9 B. & S. Gauge Hard Drawn Copper (Wire Miles)	88
No. 9 B. & S. Gauge Soft Copper Tie Wire (Wire Miles)	0.75
Cedar Poles	1,405

Progress of Construction

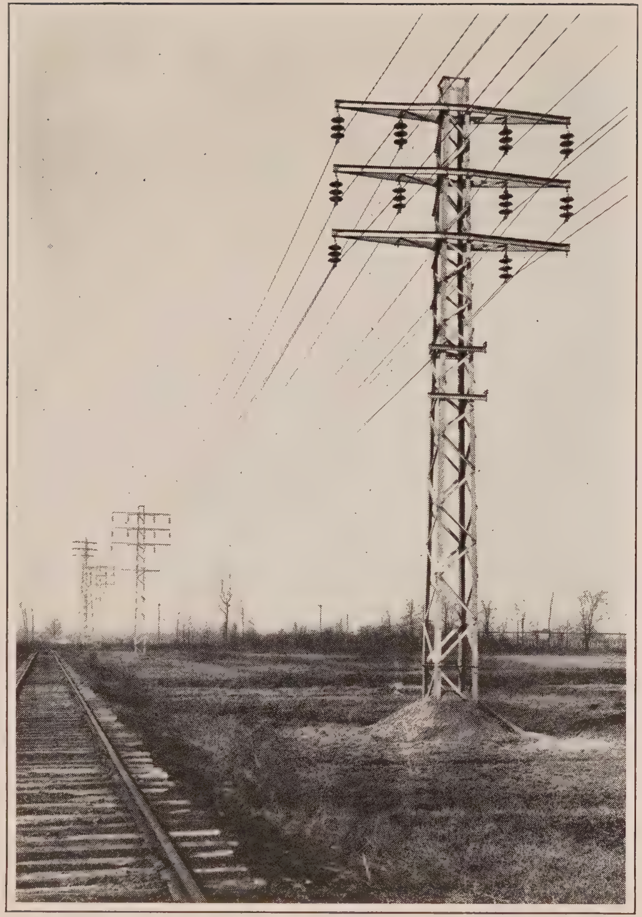
WINDSOR EXTENSION

The work of excavating and setting tower footings begun in July, 1913, was completed November 8th of the same year. Later, in March and April, 1914 it was found necessary to do considerable concrete work at Anchor footings on account of the exceptionally heavy rains that fell late in the fall of 1913 and early in the following spring. These rains kept the earth so wet and mucky that the earth footings had no chance to set properly, and it was considered advisable to place concrete around them so that cable stringing might be proceeded with.

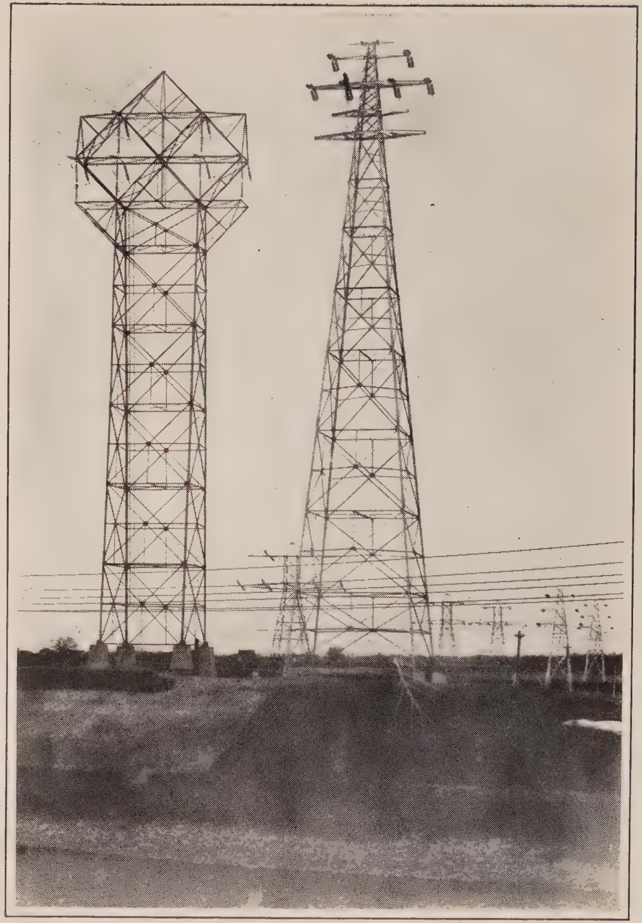
Tower assembling and erecting begun in October, 1913, was completed March 26, 1914, an average of 8 towers having been assembled and erected complete per day.

Erection of insulators commenced on March 4, 1914, was completed on Ju 28th; the stringing of the No. 3/0 B. & S. gauge copper cable begun March 1 1914, was completed on August 1st, and the line was immediately turned ove for operation.

Work on the telephone line begun early in August, 1913, was completed i the following March; the digging of holes on March 15th; pole erecting on Marc 14th and stringing of wire and completion of line on March 18th.



Welland Steel Pole Line



Welland Canal Crossing

NIAGARA DUPLICATION

Excavation and setting of footings commenced on June 23, 1914, was completed on Oct. 30, 1914, with the exception of the concrete footings for the Welland Canal crossing towers. There are 399 earth, and 50 concrete footings in this section, exclusive of the two Welland footings. This work was carried on during the dry summer months, and very little difficulty was experienced with water. Excavating was practically all through stiff clay, and very little shoring was necessary. Rock was encountered at only one point.

Tower assembling was commenced on August 13, 1914, and the first tower erected on August 17th.

Erection of insulators was begun on October 20th and stringing of the No. 4/0 B. & S. gauge copper cable on October 22nd.

A two wire telephone line for this section was built on the same right-of-way as the transmission line, the excavation work being commenced on August 26th; erection of poles on Sept. 3rd, and stringing of wire on Sept. 14th, 1914. This work was all completed on October 15th.

Work Completed

The construction work completed up to October 31, 1914, may be summarized as follows:

WINDSOR EXTENSION

Transmission Line	
Section L. St. Thomas to Chatham—58.04 miles.	
Footings set complete	76
Towers erected complete	486
Power Cable erected (wire miles)	350
Ground cable erected (wire miles)	116
Section M. Chatham to Walkerville Jct.—44.77 miles.	
Towers erected complete	322
Power cable erected (wire miles)	270
Ground cable erected (wire miles)	90
Telephone Line	
Section L.	
Poles erected	2,378
Telephone wire strung (wire miles)	232
Section M.	
Poles erected	47
Telephone wire strung (wire miles)	128

NIAGARA DUPLICATION

Section A-A. Niagara Falls to Dundas—50.03 miles.

Transmission Line	
Earth footings set complete	399
Concrete footings complete	50
Towers assembled	330
Towers erected	313
Insulator units erected	552
Power cable erected (wire miles)	27
Ground cable erected (wire miles)	9
Telephone Line	
Poles erected	1,405
Telephone wire strung (wire miles)	88

Special Construction

On account of the work of deepening and widening the Welland Canal being carried on by the Dominion Government, it was necessary to lengthen the spans across the Canal from 407 to 532 ft. To do this one standard tower was removed from the transmission line, one anchor tower was moved 45 ft. and the two high towers supporting the Canal crossing span was moved, one 63 ft. and the other 62 ft.

The important part of this construction was the moving of the two latter towers. Each weighed twenty-five tons and was supported on a heavy reinforced concrete footing. The overall height was 168 feet. For many reasons it was decided to move these towers standing and for this purpose heavy timber skidways were built, the towers well guyed, and then pulled along the skidways to the new concrete foundations.

In order to ensure continuous power during this work, two temporary lines were built, one on the northerly side of the crossing to carry circuit No. 1 and the other on the southerly side for circuit No. 2. These two crossings were made far enough apart to allow room for the largest lake vessel, and by this means a boat could pass through with very little delay and without having a complete shut-down on the power circuits.

This work was done early in the year of 1914, and although inclement weather prevailed, such progress was made that little remained to be done when navigation opened and only a few boats passed before the crossing was completed in the early part of May.

STATION EQUIPMENTS AND BUILDINGS

The stations and building extensions referred to in the last report were completed and placed in service during the year. The following distributing stations have been constructed, viz.: Cheltenham, Fergus, Elora, Woodbridge, Beaverton, Cannington and Winchester and distributing stations are under construction at Lucan, Embro, Waterford, Drumbo, Ayr, Wallaceburg, Tilbury, Dresden, Port McNicoll, Waubaushene, and Brockville. Engineering for several municipal stations has been carried on, including Windsor, Walkerville, Strathroy, Simcoe and Dundas.

Considerable study has been given the standardization of distributing stations, and standard designs have been prepared for stations of various voltages and capacities.

The Wasdell's Falls generating station was placed in service and a contract made for the generators for the Eugenia Falls generating station.

Specifications have been prepared in respect of substation equipment for the London and Port Stanley Railway electrification; these, with minor changes, will apply to other roads which may be constructed or electrified.

The tables which follow give general information on the various stations, and a diagram of the Niagara System is included, which shows the municipalities served from each transformer station.

Niagara System

NIAGARA TRANSFORMER STATION

Building Extension

Messrs. Wells & Gray, Toronto, were the successful bidders for the extension which was described in last report. The roof was finished early this spring, and the contract, including concrete bus structure, etc., was finished in August.

There has been constructed and placed in service a second sprinkling tank, which is about 60 feet by 80 feet by 6 feet deep and made of concrete. This tank is used for cooling and circulating water from the transformers in the 1913 station extension. The water is sprayed into the tank and then pumped back through the transformers again.

Additional High-Tension Equipment

The 110,000-volt apparatus for the fifth bank of three-phase, 3,500 kv-a. transformers and two lines has been installed and will be placed in service on November 4th, 1914.

Intermediate-Tension Equipment

The two 46,000-volt, 10,500-kv-a. transformer banks and three of the four 46,000-volt lines mentioned in the last report are now in use, while switching equipment has been installed for two lines as "spares." The lines are brought along the south end of the station to a 90 deg. angle, double tower, steel structure, and from here turned north to single towers, one of which is located opposite each entrance, and from there carried to wall-bracket insulators placed beneath concrete hoods which are provided to protect the wall entrance bushings.

Table No. 1

TRANSFORMER AND DISTRIBUTING STATION CAPACITIES*

Total Capacity, 193,840 Kv-a.

Station	Voltage	Transformers Installed		Transformers Ordered		Total Station Capacity Kv-a.	Total System Capacity Kv-a.
		Mfr.	Kv-a.	Mfr.	Kv-a.		
NIAGARA SYSTEM	25-Cycle						
1. Niagara Transformer Station	12,000—110,000	C.W.Co.	56,000	....	....	....	
	12,000— 46,000	C.G.E.Co.	21,000	C.G.E.Co.	3,500	80,500	
2. Dundas Transformer Station	110,000— 13,200	C.G.E.Co.	7,500	....	....	7,500	
Caledonia Dist. Station	13,200— 2,300	P.T.Co.	450	....	....	450	
Waterdown " "	13,200— 2,300	C.C.W.Co.	225	C.G.E.Co.	450	450	
Hagersville " "	13,200— 4,000	C.W.Co.	225	....	....	225	
3. Toronto Transformer Station	110,000— 13,200	C.G.E.Co.	25,000	....	....	25,000	
4. London Transformer Station	110,000— 13,200	C,G.E.Co.	5,000	C.G.E.Co.	3,750	8,750	
Dorchester Dist. Station	13,200— 4,000	M.E.Co.	75	....	....	75	
Lucan " "	13,200— 4,000	....	....	C.G.E.Co.	225	225	
5. Guelph Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	....	3,000	
Acton Dist. Station	13,200— 2,300	S.Co. of C.	225	....	....	225	
Georgetown Dist. Station	13,200— 4,000	C.W.Co.	225	....	....	225	
Rockwood " "	13,200— 2,300	C.G.E.Co.	75	....	....	75	
Cheltenham " "	13,200— 575	C.G.E.Co.	225	....	....	225	
Fergus " "	13,200— 2,300	C.G.E.Co.	225	....	....	225	
Elora " "	13,200— 2,300	C.W.Co.	225	....	....	225	
6. Preston Transformer Station	110,000— 6,600	C.G.E.Co.	3,000	....	....	3,000	
Breslau Dist. Station	6,600— 2,300	C.W.Co.	225	....	....	225	
7. Berlin Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	1,500	4,500	
New Hamburg Dist. Station	13,200— 2,200	P.E.Co.	225	....	....	225	
Baden " "	13,200— 2,300	P.E.Co.	225	....	....	225	
Elmira " "	13,200— 4,000	C.W.Co.	225	....	....	225	
8. Stratford Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	....	....	
	110,000— 26,400	C.W.Co.	5,000	....	....	8,000	
Tavistock Dist. Station	13,200— 4,000	....	....	C.W. Co.	225	225	
9. St. Mary's Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	....	3,000	
St. Mary's Cement Dist. Station	13,200— 575	C.G.E.Co.	1,500	....	....	1,500	
10. Woodstock Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	....	3,000	
Norwich Dist. Station	13,200— 2,300	S.Co. of C.	150	....	....	150	
Beachville " "	13,200— 2,300	S.Co. of C.	150	....	....	150	
Embro " "	13,200— 4,000	....	....	C.G.E.Co.	225	225	
11. St. Thomas Transformer Station	110,000— 13,200	C.G.E.Co.	3,000	....	....	3,000	
Port Stanley Dist. Station	13,200— 2,300	S.Co. of C.	150	....	....	150	

12. Cooksville Transformer Station	110,000— 13,200	C.G.E.Co.	5,000			5,000	
Mimico Dist. Station	13,200— 2,300	C.C.W.Co.	450			450	
Port Credit Dist. Station	13,200— 2,300	C.G.E.Co.	225			225	
Cooksville " "	13,200— 2,300	P.E.Co.	40			40	
Streetsville " "	13,200— 4,000	C.G.E.Co.	225			225	
Woodbridge " "	13,200— 4,000	C.G.E.Co.	225			225	
Etobicoke " "	13,200— 2,300			C.G.E.Co.	450	450	
13. Brant Transformer Station	110,000— 26,400	C.W.Co.	5,000			5,000	
Waterford Dist. Station	26,400— 2,300			C.W.Co.	225	225	
Drumbo " "	26,400— 4,000			C.G.E.Co.	225	225	
Ayr " "	26,000— 4,000			C.G.E.Co.	225	225	
14. Kent Transformer Station	110,000— 26,400	C.W.Co.	5,000			5,000	
Wallaceburg Dist. Station	26,400— 4,000			C.G.E.Co.	450	450	
Tilbury " "	26,400— 4,000			C.G.E.Co.	300	300	
Dresden " "	26,400— 4,000			C.W.Co.	225	225	
15. Essex Transformer Station	110,000— 26,400	C.W.Co.	10,000			10,000	183,440
SEVERN SYSTEM.	60–Cycle						
Penetang Dist. Station	22,000— 2,200	C.C.W.Co.	600			600	
Barrie " "	22,000— 2,300	C.G.E.Co.	700			700	
Collingwood Dist. Station	22,000— 2,300	C.G.E.Co.	750			750	
Coldwater Dist. Station	22,000— 2,300	C.G.E.Co.	225			225	
Elmvale " "	22,000— 2,300	C.W.Co.	225			225	
Stayner " "	22,000— 4,000	C.W.Co.	300			300	
Port McNicoll Dist. Station	22,000— 2,300			C.G.E.Co.	50	50	
Waubaushene Dist. Station	22,000— 2,300			C.G.E.Co.	50	50	2,900
WASDELL'S FALLS SYSTEM.	60–Cycle						
Generating Station	2,300— 22,000	C.W.Co.	1,050			1,050	
Beaverton Dist. Station	22,000— 4,000	C.W.Co.	300			300	
Cannington " "	22,000— 4,000	C.W.Co.	300			300	1,650
ST. LAWRENCE SYSTEM.	60–Cycle						
Prescott Dist. Station	26,400— 2,300	C.G.E.Co.	450			450	
Winchester Dist. Station	26,400— 4,000	C.G.E.Co.	150			150	600
PORT ARTHUR SYSTEM.	60–Cycle						
Port Arthur Dist. Station	22,000— 2,200	S.Co, of C.	5,250			5,250	5,250

*Spare transformers are included in the above.

Mfr. —Manufacturer or Agent.
C.G.E. Co. —Canadian General Electric Co., Peterboro, Ont.
C.W. Co. —Canadian Westinghouse Co., Hamilton, Ont.
C.C.W. Co.—Canadian Crocker Wheeler Co., St. Catharines, Ont.
M.E. Co. —Maloney Electric Co. of Canada, Ltd., St Catharines, Ont.
P.E. Co. —Packard Electric Co., St. Catharines, Ont.

S. Co. of C.—Siemens Co. of Canada, Toronto, Agents of Company in London, Eng.
P.T. Co. —Pittsburgh Transformer Co., Pittsburgh, Pa.
S.U.C. Co. —Standard Underground Cable Co., Hamilton, Ont.
G.M.G. Co.—G. M. Gest Co., Montreal, Que.
H.E. Co. —Harland Engineering Co., Toronto, Ont.

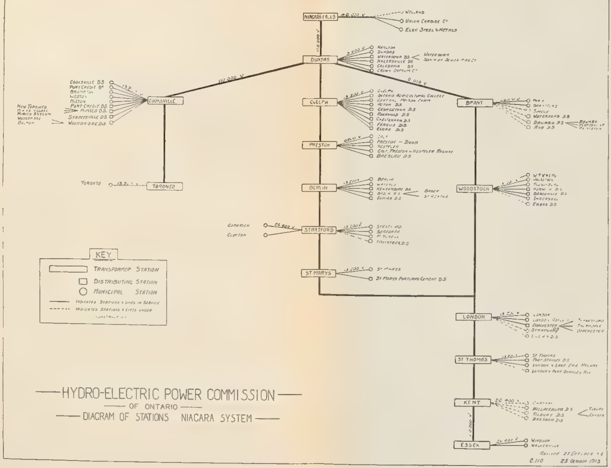
Table No. 2

STATION TRANSFORMERS PURCHASED FOR MUNICIPALITIES AND COMMISSION DURING FISCAL YEAR ENDING OCTOBER 31st, 1914

Station	Cycle	Voltage	Mfr.	No.	Capacity Kv-a.	Total Kv-a.
Niagara Falls Trans. Station...	25	13,200-46,000	C.G.E.Co.	1	3,500	3,500
	25	13,200- 575	C.G.E.Co.	3	150	450
Dundas Transformer Station—						
Waterdown Dist. Station......	25	13,200- 2,300	C.G.E.Co.	3	150	450
Toronto Transforming Station....	25	13,200- 575	.P.E.Co.	3	100	300
London Transformer Station						
Strathroy Municipal Station...	25	13,200- 2,300	C.G.E.Co.	3	75	225
Lucan Dist. Station	25	13,200- 2,300	C.G.E.Co.	3	75	225
Guelph Transformer Station—						
Corporation of Guelph	25	13,200- 2,300	C.G.E.Co.	1	225	225
Fergus Dist. Station	25	13,200- 2,300	C.GE..Co.	3	75	225
Elora " "	25	13,200- 2,300	C.W.Co.	3*	75	225
Cheltenham Dist. Station......	25	13,200 575	C.G.E.Co.	3*	75	225
Preston Transformer Station—						
Corporation of Galt	25	13,200- 2,200	M.E.Co.	3	250	750
Berlin Transformer Station—						
Waterloo Corporation	25	13,200- 2,300	C.W.Co.	2	150	300
Stratford Transformer Station—						
Tavistock Dist. Station........	25	13,200- 2,300	C.W.Co.	3	75	225
Woodstock Transformer Station.						
Embro Dist. Station	25	13,200- 2,300	C.G.E.Co.	3	75	225
Cooksville Transformer Station—						
Mimico Dist. Station	25	13,200- 2,300	C.C.W.Co.	3	150	450
Etobicoke Dist. Station........	25	13,200- 2,300	C.G.E.Co.	3	150	450
Woodbridge " "	25	13,200- 2,300	C.G.E.Co.	3	75	225
Brant Transformer Station—						
Simcoe Municipal Station......	25	26,400- 2,300	C.W.Co.	3	100	300
Waterford Dist. Station.......	25	26,400- 2,300	C.W.Co.	3	75	225
Drumbo. Dist. Station	25	26,400- 2,300	C.G.E Co.	3	75	225
Ayr Dist. Station..............	25	26,400- 2,300	C.G.E.Co.	3	75	225
Kent Transformer Station—						
Wallaceburg Dist. Station.....	25	26,400- 2,300	C.G.E.Co.	3	150	450
Tilbury District Station	25	26,400- 2,300	C.G.E.Co.	3	100	300
Dresden Dist. Station..........	25	26,400- 2,300	C.W.Co.	3	75	225
Essex Transformer Station—						
Walkerville Municipal Station .	25	26,400- 2,300	C.C.W. Co.	3	750	2,250
Windsor " "	25	26,400- 2,300	C.G.E.Co.	2	750	1,500
Port McNicoll Dist. Station......	60	22,000- 2,300	C.G.E.Co.	2	25	50
Waubaushene " "	60	22,000- 2,300	C.G.E.Co.	2	25	50
Beaverton " "	60	22,000- 2,300	C.W.Co.	3	100	300
Cannington " "	60	22,000- 2,300	C.W.Co.	3	100	300
Winchester " "	60	26,400- 2,300	C.G.E.Co.	3	50	150
Brockville Municipal Station	60	26,400- 2,300	C.G.E.Co.	3	200	600
Corporation of Port Arthur......	60	22,000- 2,300	C.G.E.Co.	4	400	1,600

*Transferred from another station.

Total Kv-a., 17,425



NIAGARA FALLS
WELLAND
UNION CARBIDE Co
ELEC STEEL & METALS
110 000 V
DUNDAS
HAMILTON
DUNDAS
WATERDOWN DS
HAGERSVILLE DS
CALEDONIA DS
CROWN GYPSUM Co
110 000 V
COOKSVILLE
COOKSVILLE DS
PORT CREDIT Bo
BRAMPTON
WESTON
MILTON
PORT CREDIT DS
MIMICO DS
STREETSVILLE DS
WOODBRIDGE DS
NEW TORONTO
MIMICO ASYLUM
WOODBRIDGE
BOLTON
TORONTO
TORONTO
GUELPH
GUELPH
ONTARIO AGRICULTURAL COLLEGE
ACTON DS
GEORGETOWN DS
ROCKWOOD DS
CHELTENHAM DS
FERGUS DS
ELORA DS
PRESTON
PRESTON - DOON
HESPELER
GALT, PRESTON & HESPELER RAILWAY
BRESLAU DS
BERLIN
BERLIN
NEW HAMBURG DS
ELMIRA DS
BADEN
STRATFORD
GODERICH
CLINTON
SEAFORTH
MITCHELL
TAVISTOCK DS
ST MARYS
ST MARYS
ST MARYS PORTLAND CEMENT DS
BRANT
BRANTFORD
SIMCOE
WATERFORD DS
DRUMBO DS
AYR DS
WOODSTOCK
WOODSTOCK
INGERSOLL
EMBRO DS
LONDON
LONDON
DORCHESTER
STRATHROY
ST THOMAS
ST THOMAS
PORT STANLEY DS
LONDON & LAKE ERIE RAILWAY
LONDON & PORT STANLEY RLY
KENT
WALLACEBURG DS
TILBURY DS
DRESDEN DS
TILBURY
ESSEX
WINDSOR
WALKERVILLE
KEY
TRANSFORMER STATION
DISTRIBUTING STATION
MUNICIPAL STATION
INDICATES STATIONS & LINES IN SERVICE
INDICATES STATIONS & LINES UNDER CONSTRUCTION
HYDRO-ELECTRIC POWER COMMISSION
OF ONTARIO
DIAGRAM OF STATIONS NIAGARA SYSTEM
C.110
25 OCTOBER 1913

Table No. 3

MISCELLANEOUS EQUIPMENT PURCHASED FOR MUNICIPALITIES AND COMMISSION DURING FISCAL YEAR ENDING OCTOBER 31, 1914

Station	Mfr.	Voltage	Description
Niagara System		25-Cycle	
Niagara Transformer Station	S.U.C. Co.	13,200	8,000 ft., 300,000 c.m. P.I.L.C. Cable
	G.M.G. Co.	13,200	22,000 duct ft. of conduit system
Union Carbide Co.	C.W. Co.	46,000	Metering equipment.
Electric Steel and Metal Sta.	C.G. E. Co.	46,000	Metering and switching equipment.
Dundas Transformer Station—			
Dundas Municipal Station	C.W. Co.	13,200-2,300	Switching equipment.
Toronto Transformer Station	C.G.E. Co.	13,200	Switchboard panels.
London Transformer Station	C.G.E. Co.	13,200	Switching equipment for 2 feeders.
	C.G.E. Co.	110,000	H.T. switch. equip. for 1 trans. bank.
London and Port Stanley Ry.	C.G.E. Co.	13,200-1,500	4-500 kv-a., rotary converters, transformers and switching equipm't.
London Street Ry.	C.G.E. Co.	13,200- 600	2-500 kv-a., rotary converters, transformers and switching equipm't.
Strathroy Municipal Station	C.G.E. Co.	13,200-2,300	Switching equipment.
Lucan Dist. Station	C.W. Co.	13,200-2,300	" "
Guelph Transformer Station	C.G.E. Co.	13,200	Switching equipment for 3 feeders.
Cheltenham Dist. Station	C.W. Co.	13,200- 575	Switching equipment.
Fergus Dist. Station	C.W. Co.	13,200-2,300	" "
Elora Dist. Station	C.W. Co.	13,200-2,300	" "
Preston Transformer Station—			
Preston Municipal Station	C.W. Co.	6,600	Switching equipment for 1 feeder.
Stratford Transformer Station—			
Tavistock Dist. Station	C.W. Co.	13,200-4,000	Switching equipment.
Woodstock Transformer Station—			
W. T. V. & I. Ry.	C.W. Co.	13,200	Metering equipment.
Embro Dist. Station	C.W. Co.	13,200-4,000	Switching equipment.
Cooksville Transformer Station—			
Mimico Dist. Station	C.G.E. Co.	2,300	Switching equipment for 1 feeder.
Etobicoke Dist. Station	C.G.E. Co.	13,200-2,300	Switching equipment.
Woodbridge Dist. Station	C.W. Co.	13,200-4,000	" "
Brant Transformer Station—			
Simcoe Municipal Station	C.W. Co.	26,400-2,300	Switching equipment.
Waterford Dist. Station	C.W. Co.	26,400-2,300	" "
Drumbo Dist. Station	C.W. Co.	26,400-4,000	" "
Ayr Dist. Station	C.W. Co.	26,400-4,000	" "
Kent Transformer Station—			
Wallaceburg Dist. Station	C.W. Co.	26,400-4,000	Switching equipment.
Tilbury Dist. Station	C.W. Co.	26,400-4,000	" "
Dresden Dist. Station	C.W. Co.	26,400-4,000	" "
Essex Transformer Station—			
Walkerville Municipal Station	C.W. Co.	26,400-4,000	Switching equipment.
	C.G.E. Co.	4,000	50 kv-a., potential regulator.
Windsor Municipal Station	C.W. Co.	26,400-4,000	Switching equipment.
	C.G.E. Co.	4,000	90 kv-a., potential regulator.
Severn System		60-Cycle	
Barrie Dist. Station	....	22,000	Switching equipment for No. 2 line
Collingwood Dist. Station	....	22,000	" " " "
Stayner Dist. Station	C.W. Co.	4,000	Switching equipment for 1 feeder.
Port McNicoll Dist. Station	C.G.E. Co.	22,000-2,300	Switching equipment.
Waubaushene Dist. Station	C.G.E. Co.	22,000-2,300	" "
Wasdell's Falls System			
Beaverton Dist. Station	C.W. Co.	22,000-4,000	" "
Cannington Dist. Station	C.W. Co.	22,000-4,000	" "
Eugenia System		60-Cycle	
Eugenia Falls Generating Station	C.W. Co.	4,000	Two 1,410 kv-a., 3-phase generators.
St. Lawrence System		60-Cycle	
Winchester Dist. Station	C.W. Co.	26,400-4,000	Switching equipment.
Port Arthur System		60-Cycle	
Corporation of Port Arthur	C.W. Co.	22,000	Switching equipment for 1 feeder.

NOTE—The above only includes the more important equipment.

A contract was placed with the Canadian General Electric Co. on September 24th to furnish a 3,500-kv-a., 13,200/46,000-volt transformer (a duplicate of those already supplied) to be used as a "spare" in connection with the two present banks. The contract specifies delivery on or before February 24th, 1915.

Low-Tension Feeders

A "spare" feeder installed under contract by the Canadian British Insulated Co. of Montreal was placed in service last April. This is the fifth three-phase, 300,000 c.m., lead-covered, paper insulated, cable feeder which has been installed in the Murray Street duct line from the Ontario Power Co. Five more feeders of the same capacity have been purchased and are now being installed in duct line No. 2. Three of these feeders are being supplied and installed by the Canadian British Insulated Co. and the other two by the Standard Underground Cable Co. of Hamilton, Ont. Two are to be used to supply the two 10,500-kv-a., 46,000-volt transformer banks. One of these was placed in service on October 29th, 1914. The third will supply the 10,500-kv-a., 110,000-volt transformer bank, and is to be placed in service on November 4th, 1914; while the fourth and fifth feeders are to be used as "spares" until another 110,000-volt transformer bank is installed, when one of them will be employed to supply this new transformer bank.

Tenders have been received for two sets of 12,000-volt switching equipments for the fourth and fifth feeders which were laid in duct line No. 2. Each of these sets are to consist of a feeder reactance oil circuit-breaker, disconnecting switches, bus, etc., similar to those already supplied for the other feeders recently installed.

Three 150-kv-a., 12,000/575-volt, single-phase, self-cooled transformers have been purchased from the Canadian General Electric Co. for heating the Niagara Station. These transformers will also be used in connection with two 50 h.p., three-phase motors employed to drive circulating water pumps for the transformers. One of these pumping sets has already been delivered by the Harland Engineering Co. of Toronto. Ten-kw., 550-volt, three-phase electric radiators are at present under construction at the Commission's machine shop on Strachan Avenue, Toronto. These are to be used to heat the 1913 extension and the old station building. The extension has three electric circuits controlled from a panel. The heating transformers are located in the basement. One circuit is carried in conduit on the east basement wall, the second on the west basement wall, and supply the radiators beneath the windows on the main floor and in the basement. The third circuit runs to the switchboard-room. Each radiator is provided with two-heat-regulation, controlled by knife switches located on a panel mounted on the radiator frame. The old station will also be provided with a heating circuit installed along the west basement wall which will be employed this winter, so that the steam heating previously used will only be required during extremely cold weather.

No. 2 Conduit Line

The last report referred to a second and independent conduit system from the Ontario Power Co., known as the Dixon Street conduit line. Later it was decided to purchase a private right-of-way running approximately in a straight line between the transformer station of the Commission and the distributing station of the Ontario Power Co. The saving effected by the shorter duct run and cable lengths more than compensates for the cost of the property which it was necessary to purchase, and the property would also be available for another duct run should it be required.

Specifications were issued for this duct line and tenders requested. The contract was awarded to the G. M. Gest Co., of Montreal. The duct line is about 1,828 feet long and provided with eight manholes; the longest distance between manholes being 307 feet. The line consists of 12 ducts, two wide and six high, purchased by the Commission from the Clay Products Co., of Brazil, Indiana. These ducts have a minimum square bore of 3⅝ in. with a ¾ in. wall, and after they were laid a 3⅜ in. square steel mandrel 20 in. long was drawn through each duct and a No. 10 B.W.G. iron wire was left in the ducts to be used as a fishing wire when the cables were installed. The ducts were laid closely together and surrounded by 3 inches of concrete on the sides and top and a 4-in. concrete base.

The manholes were constructed of concrete with 7-ft. headroom. The tops consist of 6-in. reinforced concrete slabs which support the cast iron manhole frames and covers. This light manhole top construction is made possible by the location of the manholes, which are, as previously mentioned, on private property, where there is no heavy traffic. Each manhole has five 1½-in. by 9-in. shelves on each side for supporting the cables. The spacing between the shelves is 8 in. In some cases 3-in. deep recesses were left in the manhole walls, and the concrete slabs grouted into the recesses after the form work for the walls had been removed, while in other cases the slabs were poured with the walls. This construction assures exceptionally neat appearing manholes. About 12 feet from manholes the ducts commence to change from the close centre to centre spacing of 5½-in. to a spacing of 9½-in. where they enter the manhole. This allows the cable to leave the duct at the level of and in line with the manhole shelves.

Ten of the twelve ducts are to be used for five power feeders of two cables each, while the other two ducts are to be employed for other small cables that may be required, such as for instance, telephone, lighting, etc.

The system is drained by means of two 4-in. agricultural tile pipes, laid at each side of the duct run and entering each manhole on a level with a 3-in. gutter in the floor, so that they also drain the manholes. No. 1 and No. 8 manholes are connected to separate drainage systems. In this way the whole system of eight manholes is drained with only two sewer connections.

Union Carbide Company

The Union Carbide Company has installed a plant at Welland, Ontario, and is being supplied with three-phase power at 46,000 volts over three transmission lines from the Niagara Station.

Their present equipment consists of Westinghouse switching apparatus for controlling four incoming three-phase, 46,000-volt lines, and five feeders. One feeder supplies three Canadian General Electric, single-phase, 400-kv-a., 26,400/220-volt service transformers. Three feeders are connected to Canadian Crocker Wheeler three-phase, 4,500-kv-a. transformers, and the fifth feeder supplies three Canadian General Electric, single-phase, 3,000-kv-a. transformers. The connections between the switching equipment and transformers consist of three-phase, 46,000-volt paper insulated, lead-covered cables.

The Union Carbide Company submitted their layout drawings to the Commission for approval. The Commission purchased from the Canadian Westinghouse Company the following equipment erected in the Union Carbide Company's station for metering, at the incoming lines, the power used by the Company:—Nine 46,000-volt current transformers (3 for each of the three lines), and with "secondaries" connected in parallel on the one set of meters; four potential transformers (2 for each of two busses); one graphic recording wattmeter; one graphic

recording power factor meter; one indicating wattmeter, and potential change-over switch, test links and panel. This equipment was placed in service on July 16, 1914.

Electric Steel and Metals Station

The Electric Steel and Metals Company has erected a plant at Welland, Ontario, and have contracted to purchase power at 46,000 volts. The substation was built of brick by the Electric Steel and Metals Company as an extension to their plant building. The equipment consists of one incoming three-phase, 46,000-volt line; one 900-kv-a., 46,000/100-volt, three-phase, water-cooled, Canadian Crocker Wheeler transformer for the electric furnace; three single-phase, 100-kv-a., 26,400/550-volt self-cooled, Westinghouse transformers for plant service, together with the necessary switching equipment. The oil circuit breakers between the 46,000-volt bus and the transformers are hand-operated and controlled from the furnace-room.

The metering equipment, which is the property of the Welland Hydro-Electric Commission, consists of two 46,000-volt current transformers, two 46,000-volt potential transformers with disconnecting switch fuses, one graphic recording wattmeter, one graphic recording power-factor meter, three ammeters, one voltmeter, together with test links, panel, etc. The 46,000-volt switching equipment was installed by the Commission while the transformers and low tension connections were installed by the Electric Steel and Metals Company. The station will be placed in service early in November.

DUNDAS TRANSFORMER STATION

High-Tension Extension

All the equipment mentioned in the last report as being supplied by the Canadian Westinghouse Company for the control of the new line to St. Thomas and the two new lines to Niagara was completely installed in August and the line to St. Thomas placed in operation.

Additional Feeders

The two new 13,200-volt feeders for Hamilton, described in the last report, will be completely installed by the end of November. The concrete structure has already been built and the apparatus delivered ready for installing. (See diagram of Niagara System for the several places supplied at 13,200 volts from this station.)

Waterdown Distributing Station

This station has two 2,300-volt, three-phase feeders, one to the village of Waterdown and one to the Dominion Sewer Pipe Company. The load on the latter has so increased during the last year that it was necessary to increase the transformer capacity from three 75-kv-a., single-phase transformers to three 150-kv-a. transformers, which are to be supplied by the Canadian General Electric Company and will be installed as soon as received. The 75-kv-a. transformers are to be transferred to another station.

Corporation of Dundas

The municipality of Dundas has been housing its apparatus in the Commission's transformer station, but with the completion of the feeder capacity of this station, all the spare room will be required, and they are now building a separate distributing station in the town. This station will be similar to the

Niagara Transformer Station

Toronto Transformer Station

standard Type " D." The municipality requested tenders on this building according to the Commission's drawings and are proceeding with the construction of the same. The three 150-kv-a., 13,200/2,200-volt transformers are to be transferred from the present station to the municipal station. The switching equipment has been purchased from the Canadian Westinghouse Co. by the Commission for the municipality.

TORONTO TRANSFORMER STATION

Building Extension

Messrs. Witchall & Son, of Toronto, have completed the building mentioned in last report. The additional bank of three 2,500-kv-a., single-phase, 110,000 "Y"/ 13,200 " delta " volt, oil-insulated, water-cooled transformers have been installed and will be placed in operation early in November. This makes a total installed 110,000-volt transformer capacity of 22,500 kv-a., besides a spare 2,500-kv-a. unit. The 110,000-volt bus in the old station has been extended and connected to the high tension side of the new 7,500-kv-a. transformer bank, through a "K-15" oil switch and two sets of disconnecting switches. The connecting material consists of one-inch copper tubing. The oil switch is automatic for overload operation through series trip coils. The low-tension side of the new bank is connected in the same manner as the previous transformers i.e., by means of cable and an "H-3" motor operated, three-pole, oil switch and disconnecting switches to a 13,200-volt, three-phase bus in a brick structure. The above equipment was installed by the Canadian General Electric Company. The remainder of the 13,200-volt apparatus was purchased by the Toronto Hydro-Electric System from the Canadian General Electric Company, and consists of equipment for one bus "tie" to the old bus and five new 13,200-volt feeders. The 13,200-volt oil switches, together with disconnecting switches, instrument transformer, and four smaller capacity feeder switches, etc., are installed in a brick structure, while another brick structure was built for two additional banks of transformers, one bus tie and six feeders. Besides the above, the Toronto Hydro-Electric System have installed in this station two banks of three, 500-kv-a., 13,200/2,200-volt, single-phase transformers, together with 2,200-volt feeders, switchboard, and the necessary switching equipment for the same.

The heating equipment for the extension will consist of 10-kw., three-phase, 220-volt, electric radiators located within the building on the outside walls beneath the windows on the main floor and in the basement. These should maintain a temperature of about 55 deg. fahr. in the station during the coldest weather. The operator's room will be provided with additional heaters sufficient to maintain a temperature of 70 deg. fahr. or over. The extension altogether will require about 150 kv-a. capacity in heaters. The old building is at present heated by steam, but will later be heated electrically and will require about 150 kv-a. in additional heater capacity. For this purpose three 100-kv-a., 13,200/230 115-volt, single-phase transformers have been purchased from the Packard Electric Co. These transformers, together with the 13,200-volt and the 220-volt wiring and the fused knife-switches for the several heating circuits, are being installed by the Commission.

LONDON TRANSFORMER STATION

High-Tension Extension (1913)

The equipment for the 110,000-volt lines to Woodstock and St. Thomas, described in the last report, was completely installed and placed in service in August.

Additional Feeders

On May 14th a contract was placed with the Canadian General Electric Company for the supply of the complete switching equipment for two additional 13,200-volt feeders, including lightning arresters, disconnecting switches, choke coils, expulsion fuses, potential and current transformers, oil switches (complete with cell material excepting floor steel and structure), panel, meters, relays and bus and cable insulator supports. An oil switch was also included for connection between the transformers and the 13,200-volt bus. The oil switch structures and equipment will be installed by the Commission.

Building Extension (1914)

In order to house additional equipment that is required it was decided to extend the station building 48 feet. This extension will accommodate five more 1,250-kv-a., single-phase, 110,000 volt transformers, together with the necessary high-tension and low-tension switching equipment, four 13,200-volt, three-phase feeders and switchboard. The complete building will be 182 feet long. There will also be a basement under approximately one half of the extension and the greater part of it will be used as a storeroom. Drawings and specifications were prepared for this extension and the contract was placed in September with the Messrs. Hyatt Brothers, of London, who constructed the older part of the building.

Additional Equipment

A contract was placed on October 17th with the Canadian General Electric Co. for three, 1,250-kv-a., 110,000/13,250-volt transformers, together with the necessary high-tension switching equipment. The transformers are to be shipped prior to December 31st, 1914, and the switching equipment prior to February 15th, 1915. Tenders have also been received for low-tension switching equipment for the above transformers. This will give the station a capacity of 7,500 kv-a., and a 1,250-kv-a. spare transformer.

Strathroy Municipal Station

Drawings for a standard station, together with building specifications were forwarded to the municipality of Strathroy and a brick building constructed with inside dimensions of 16 ft. by 20 ft. by 14 ft., which will accommodate three 150-kv-a. transformers, two incoming, 13,200-volt lines and three outgoing, 2,300-volt lines. The building is located on a lot beside the Water and Light Commission's office building.

Standard electrical layout drawings were prepared and tenders requested for the supply of the following equipment erected in the station: three 75-kv-a., 13,200/2,300-volt, single-phase, self-cooled transformers; one 20-kw., constant current, street lighting, transformer and switching equipment, together with switchboard for controlling the above transformers; one 13,200-volt, three-phase overhead, incoming line; one three-phase, four-wire, feeder and one single-phase, street-lighting feeder. Six tenders were received for the power transformers, two for the street-lighting transformers, four for the switching equipment and two for the complete equipment. A contract for the total installation was placed with the Canadian General Electric Company which is now engaged in installing the equipment. This station will be placed in service some time in November.

Lucan Distributing Station

Tenders have been received for the construction of a brick building similar to the standard Type "E" station to contain three Canadian General Electric 75-kv-a., 13,200/2,300-volt, single-phase, self-cooled transformers, together with Westinghouse switching equipment for one incoming, 13,200-volt line and one outgoing 4,000-volt, three-phase, 4-wire, grounded neutral feeder. A standard horn gap, air type, three-pole, disconnecting switch will also be installed on a pole outside the station for isolating the station on the 13,200-volt side.

GUELPH TRANSFORMER STATION

Operators' Room

A portion of the north end of switchboard room was separated from the rest of the station by a 2¼-inch partition wall, consisting of plastered "Hyrib" and windows. The room formed, which contains the telephones and the operators' desk, can be easily heated and in this way comfortable quarters are secured for the operator without heating the whole station.

High-Tension Emergency Bus

A 110,000-volt emergency bus conductor has been placed above the transformers and together with the three main bus conductors has been extended over the spare transformer in the erection room, thus enabling one man in a very few minutes to connect the spare transformer in place of any one of the three transformers that are now in service.

Low-Tension Emergency Bus

A three-phase, 13,200-volt, connection is now being installed between the 13,200 volt feeders and the 110,000-volt line so that 13,200-volt power can be supplied from Dundas station over the 110,000-volt line to feed the 13,200-volt feeders when the 110,000/13,200-volt transformer bank is out of service.

Additional Feeders

Three 13,200-volt, three-phase, overhead feeders have recently been installed. One is to be used in conjunction with the original feeder supplying the Central Prison Farm, Ontario Agricultural College, Acton, Rockwood and Georgetown, and the other two for transmitting power to Elora and Fergus. The equipment for each line consists of disconnecting switches, oil switches, choke coils, electrolytic lightning arresters, instrument transformers, meters and switchboard panels. This equipment was purchased from the Canadian General Electric Company, as was also the previous apparatus, and together with the oil switch cell work and barriers, were installed by the Commission. It will probably be placed in service early in November.

Central Prison Farm

The permanent power house mentioned in last report is now under construction. The walls and roof are all completed and the installation of equipment will be commenced shortly. The floor will be laid within a few days and then the electrical equipment will be transferred from the temporary building, in which it is now located, to a room in the power house.

Corporation of Guelph

Drawings and specifications for a 13,200-volt station building were prepared and forwarded to the corporation of Guelph, who built the station. The corporation requested and received tenders for one 225-kv-a., three-phase, 550-volt

transformer, which was to operate in parallel with the two transformers at present in the 110,000-volt transformer station. The tenders were submitted to the Commission and the contract placed with the Canadian General Electric Company. The transformer will be placed in service as soon as received.

Cheltenham (Terra Cotta) Distributing Station

The Interprovincial Brick Company has established a brick works between Terra Cotta and Cheltenham and are purchasing power from the Commission. They have built a standard Type "D" station structure, which is approximately 17 ft. by 20 ft. by 14 ft. inside dimensions, with room for three 150-kv-a. transformers, two incoming 13,200-volt lines and three 2,300-volt feeders. Switching equipment for one 13,200-volt incoming line and one 575-volt, three-phase feeder, purchased from the Canadian Westinghouse Company, has been in service for about three months. Three 75-kv-a., Canadian General Electric transformers were removed from the Mimico Distributing Station and installed here.

Nichol Distributing Station

The plan of distribution for Fergus and Elora provided for a station midway between Fergus and Elora, which are located about three miles apart. This station was to be called the Nichol Distributing Station, after the township in which the two corporations are situated. Contracts had already been placed for part of the necessary equipment when the two municipalities signified a desire to have separate stations, and as the equipment ordered was "standard," it was easily used in one of the new stations.

Fergus Distributing Station

A standard Type "E" brick building was built by H. G. Wynes, of Collingwood, to contain electrical equipment for controlling the distribution system in Fergus. The present installation consists of one incoming 13,200-volt line, three 75-kv-a. transformers and one 2,300-volt feeder. The transformers were supplied by the Canadian General Electric Company. The 13,200-volt choke coils and fuses, together with the 2,300-volt lightning arrester, oil switch, bus and metering equipment was supplied and installed by the Westinghouse Company. A three-pole, horn gap, air break switch, developed by the Commission, was installed in the 13,200-volt incoming line on a pole structure outside the station for disconnecting the station on the high-tension side.

This station was placed in service on the 22nd of October.

Elora Distributing Station

A duplicate of Fergus Station and equipment was installed in Elora by the same contractors and placed in service on October 22nd for the Elora street lighting system. At the present time one of the three Fergus transformers is installed in this station to supply single-phase power. The three 75-kv-a. transformers intended for use here are at present in the Georgetown Station but will be removed about the beginning of November.

PRESTON TRANSFORMER STATION

Operators' Room

An operators' room similar to that constructed at Guelph has been built in this station.

Corporation of Galt

Three 250-kv-a., 6,600/2,200-volt, single-phase transformers were purchased by the Commission for the corporation of Galt from the Maloney Electric Company and installed in the corporation's main substation. These were used to replace three 150-kv-a., Packard transformers which were removed to a new station built by the corporation in the centre of the power district in the south part of the city. The Commission prepared the contract between the corporation and the Maloney Electric Company of Canada, Limited, and inspected the transformers in the factory.

Preston Municipal Station

In December, 1913, an additional power feeder, including panel, meters and oil switch, was purchased for the Preston Water and Light Commission, from the Canadian Westinghouse Company, who had previously supplied a line panel, a service feeder panel and one power feeder panel. Three 6,600-volt, single-pole, lightning arresters were also purchased from the Northern Electric Company for the Doon line.

BERLIN TRANSFORMER STATION

Building Extension (1913)

The extension required for the second bank of transformers has been built and the Canadian General Electric Company has practically completed the installation of the electrical equipment.

An operators' room was also built when the above extension was made.

Waterloo Corporation

During the early part of the year assistance was given the corporation of Waterloo in procuring the necessary apparatus to enable them to purchase power from the Commission. Previously they generated their own power by steam. Two 150-kv-a., 13,200/2,300-volt, single-phase transformers which complied with the Commission's standard specifications were purchased by the corporation from the Canadian Westinghouse Company. These were inspected in the factory by the Commission's inspector. The corporation also purchased a new switchboard complete with oil switches and meters, etc., from the Westinghouse Company. The Commission prepared drawings giving the layout of all apparatus in the municipal station and bought and installed all the connecting material for the corporation.

STRATFORD TRANSFORMER STATION

Building Extension (1913)

The extension to accommodate the second bank of 1,250-kv-a. transformers was built by Messrs. Wells & Gray of Toronto. The transformers were installed by the Canadian Westinghouse Company and have been placed in temporary service on the 13,200-volt power lines. The Canadian General Electric Company have practically finished the installation of the permanent 110,000-volt and 26,400-volt switching equipment, and within a few days 26,400-volt power will be supplied to Clinton and Goderich.

Town of Goderich

The switching and metering equipment referred to in last report has been installed and placed in service, using 13,200-volt power from Stratford Transformer Station. Power will soon be available for delivery at 26,400 volts, at which time the transformers will merely have to be reconnected on the terminal board for 26,400 volts.

Town of Clinton

The switching and metering equipment mentioned in the last report has been installed and in service with 13,200 volts on the high-tension side for about nine months. This station will shortly be fed with 26,400-volt instead of 13,200-volt power from Stratford Station.

ST. MARY'S TRANSFORMER STATION

Operators' Room

An operators' office, with a floor space of 11 ft. 6 in. by 7 ft. 10 in. has been partitioned off in this station.

WOODSTOCK TRANSFORMER STATION

Operators' Office

A floor space of 11 ft. 6 in. by 7 ft. 11 in. at the end of the switchboard room was partitioned off for the use of the operators. This room is similar to those constructed at Preston, St. Mary's, Guelph and St. Thomas.

High-Tension Roof Structure

Drawings have been prepared for a structure to support three "downward pull" 110,000-volt, single-pole disconnecting switches above the roof of the transformer station. It is proposed to connect Woodstock Station on the second high-tension line between Dundas and London and use the above switches for sectionalizing the other line between Brant Station and London Station.

Woodstock, Thames Valley and Ingersoll Railway

An extension to the generating equipment in the power house of the Woodstock, Thames Valley and Ingersoll Railway Company has been made to provide for a supply of power from the Commission.

The railway company purchased one rotary converter, the necessary starting reactance and panel and three single-phase transformers. The Commission prepared drawings showing the layout of the above equipment, together with the incoming 13,200-volt line apparatus and all connecting material, purchased this apparatus and installed the complete equipment.

Metering Panel

Equipment consisting of a Westinghouse recording wattmeter and a Siemens maximum demand, watt-hour meter, together with the current and potential transformers, test links and panel were installed in the power house of the Woodstock, Thames Valley and Ingersoll Railway for metering the 13,200-volt power used by them. This metering equipment is the property of the Commission.

Embro Distributing Station

A brick building with a floor space of 12 ft. by 15 ft. and an inside height of 14 ft., with accommodation for one incoming three-phase, 13,200 volt line from the Woodstock Transformer Station; two three-phase, 4,000-volt feeders; three 150-kv-a. transformers and switching equipment, was constructed by H. G. Wynes, of Collingwood.

Three 75-kv-a., 13,200/2,300-volt, single-phase transformers have been purchased from the Canadian General Electric Co., and are to be delivered about the 1st of November.

The switching equipment consisting of 13,200-volt choke coils and fuses for one incoming line; a 4,000-volt bus; oil switch; instrument transformer and lightning arresters together with the switchboard for one feeder has been purchased from the Canadian Westinghouse Company, which is to deliver and install it about the 1st of November.

A three-phase, horn gap, air brake, disconnecting switch designed by the Commission will be installed on a wooden pole outside the station for disconnecting the station on the 13,200-volt side.

ST. THOMAS TRANSFORMER STATION

Building Extension (1913)

The 32-foot extension required for the new line to London and the two new lines to the Essex Station has been completed.

The electrical equipment has all been installed by the Canadian Westinghouse Company and the three additional 110,000-volt lines have been placed in service.

Operators' Room

A portion of the switchboard room 11 ft. 6½ in. by 7 ft. 10½ in. in size has been partitioned off. Sufficient windows have been provided to allow the operator a clear view of the switchboard room. The former room provides a cleaner place for the operator and makes possible a more economical heating of the station.

City of St. Thomas

The South End Station with all its equipment was placed in service early this year.

COOKSVILLE TRANSFORMER STATION

Low-Tension Extension

The four additional 13,200-volt feeders supplied and installed by the Westinghouse Company were all placed in service last January.

Operators' Room

A space of about 12 ft. 6 in. by 10 ft. 6 in. at the west end of the switchboard was partitioned off to contain the telephones and operators' desk.

Mimico Distributing Station

A third 2,300-volt, three-phase feeder of 300-kv-a. capacity has been installed in this station for distributing power to New Toronto. The bus extension, and switching equipment, together with the switchboard panel, three ammeters and one graphic, power-factor meter were supplied by the Canadian General Electric Company and installed by the Commission. This extra feeder necessitated increasing the transformer capacity to three 150-kv-a. transformers which were purchased from the Canadian Crocker-Wheeler Company. The three original 75-kv-a. transformers were removed to the Cheltenham Distributing Station. The installation of the transformers was completed about May 15th, 1914, and of the feeder about the first of October.

Etobicoke Distributing Station

The power demand in the township of Etobicoke is increasing very rapidly and a new station will soon be required in addition to the Mimico Distributing Station. When equipment was being purchased for several other distributing stations, an opportunity was afforded to buy an additional equipment at a very low figure and a contract was placed with the Canadian General Electric Company for three 150-kv-a. transformers, switching equipment for one 13,200-volt line and two 2,300-volt feeders, suitable for installation in a standard station.

Woodbridge Distributing Station

A standard 13,200-volt brick station building was built by Wells & Gray of Toronto for the municipality of Woodbridge. The Canadian General Electric Company delivered three 75-kv-a., 13,200/2,300-volt, single-phase transformers, which had previously been purchased, on the 9th of October.

The Canadian Westinghouse Co. supplied and installed switching equipment for one incoming 13,200-volt line and two 4,000-volt, 200-kv-a., three-phase, four-wire feeders.

The Commission is installing a standard 13,200-volt, three-pole, horn-gap, air-break, disconnecting switch on a pole outside the station for disconnecting the incoming line.

This station was placed in temporary operation on October 12th for Thanksgiving Day celebrations and will be placed in permanent service early in November.

BRANT TRANSFORMER STATION

The Brant Transformer Station was placed in service on the 1st of January, 1914, and since then 26,400-volt power has been supplied to the corporations of Brantford and Paris.

The cubical contents of this station is about 150,000 cu. ft. plus 6,000 cu. ft. in the basement and 7,500 cu. ft. in the control room. There were nine 10-kw., 220-volt, three-phase electric radiators installed in the building last winter. These are disconnected during the periods of peak load on the system. One radiator in the control room which is partitioned off from the rest of the building easily maintained a temperature of over 70 deg. fahr. and at the same time allowed good ventilation. The radiators were disconnected several times for one or two hours, and at the end of these intervals the temperature was found to have fallen only 6 or 7 deg. fahr. The rest of the station was maintained at a temperature of about 50 deg. fahr. excepting for short intervals when the heaters were not in operation.

Corporation of Brantford

The equipment mentioned in last report has been completely installed. The station was placed in service on January 17, 1914.

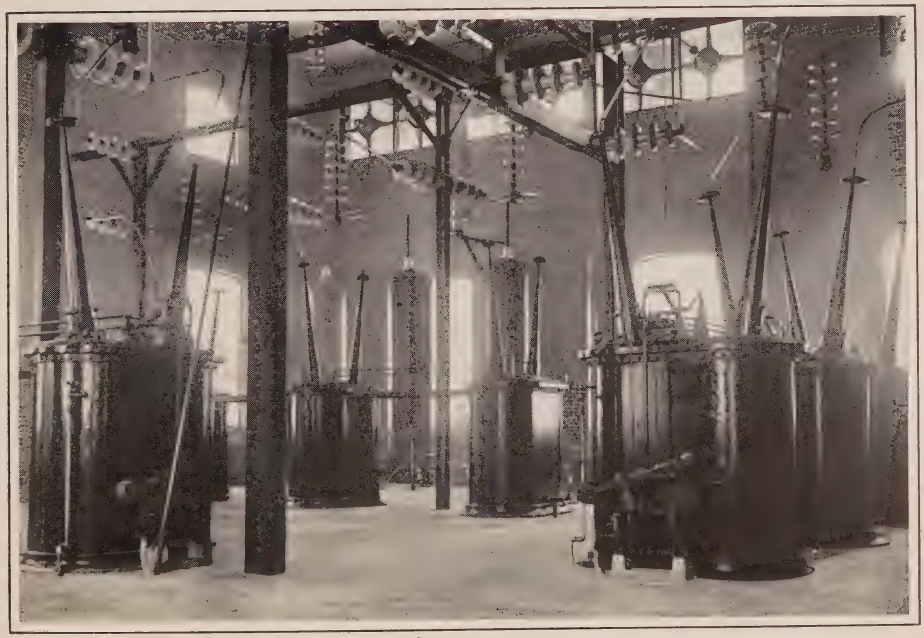
Corporation of Paris

Power was first delivered to Paris at 26,400 volts on January 4, 1914.

Simcoe Municipal Station

A standard Type "G" station is being built by Mr. Gunton, a local contractor, for the municipality of Simcoe. It will be completed about the middle of November.

High-Tension Room—London Transformer Station



High-Tension Room—Brant Transformer Station

The equipment consisting of three 100-kv-a., single-phase, 26,400/2,300-volt transformers and switching equipment for one incoming 26,400-volt line and two 4,000-volt, three-phase, four-wire feeders has been purchased by the Commission for the corporation of Simcoe from the Canadian Westinghouse Company of Hamilton and will be delivered and installed during November.

Waterford Distributing Station

Tenders have been received from the construction of a standard Type "H" station building in Waterford. Three 75-kv-a. transformer and switching equipment for one 26,400-volt incoming line and one 100-kv-a., 2,300-volt feeder were purchased from the Canadian Westinghouse Company and will be delivered early in November.

Drumbo Distributing Station

Arrangements have been made to supply power to Drumbo at 26,400 volts from Brant Transformer Station. A standard Type "H" brick station with a floor space of 13 ft. by 15 ft. 8 in. and an inside height of 15 ft. 8 in. has already been built under contract by Messrs. Wells & Gray. This station has an approximate ultimate capacity of three 150-kv-a. transformers and with outlets for one 26,400-volt, three-phase, incoming line and three three-phase, four-wire, 4,000-volt outgoing feeders.

Three 75-kv-a., 26,400/2,300-volt transformers were purchased from the Canadian General Electric Company for this station. Switching equipment for controlling one 26,400-volt, three-phase, incoming line, the high and low-tension circuits of the three transformers; 4,000-volt, three-phase bus and three 4,000-volt, three-phase, four-wire grounded neutral feeders, was purchased from and installed by the Canadian Westinghouse Company. This station will be placed in service about the 1st of November.

Ayr Distributing Station

The municipality of Ayr which is situated about ten miles north-west of the Brant Transformer Station will receive power from a distributing station which will be fed at 26,400 volts. The building is to be similar to the standard Type "H" station and is at present under construction by Messrs. Wells & Gray. The switching equipment has been purchased from the Canadian Westinghouse Company and will control one incoming 26,400-volt, three-phase line, one outgoing 150-kv-a., 4,000-volt, three-phase feeder and three Canadian General Electric, single-phase, 75-kv-a., 26,400/2,300-volt, self-cooled transformers.

KENT TRANSFORMER STATION

The Kent Transformer Station was built near the city of Chatham, in the county of Kent, and arrangements have already been made to supply power to the city of Chatham and the corporations of Wallaceburg, Dresden and Tilbury.

The switching equipment was supplied by the Canadian Westinghouse Co., and consists of two 110,000-volt lines from St. Thomas; two 110,000-volt lines to Essex; 110,000-volt connection to a bank of three 1,250-kv-a., single-phase transformers; four 1,250-kv-a., 63,500/26,400-volt, single-phase transformers; 26,400-volt connections to the transformer bank; 26,400-volt, three-phase bus; six 26,400-volt outgoing feeders; one 26,400-volt service feeder; three 100-kv-a., 26,400/575-

volt station transformers; three 575-volt, three-phase feeders (one for station service transformers, one for heating circuits and one for local distribution); three 15-kv-a., 575/220/110-volt service transformers; switchboard; control battery and all auxiliary control apparatus.

All the 110,000-volt, 26,400-volt and 575-volt oil switches are electrically operated from one switchboard.

The lightning arresters are of the electrolytic type with grounded tanks for an ungrounded neutral system. There are two horn gaps in series on each phase, one of which is shunted by a resistance. During "charging" this resistance cuts down the initial heavy currents and during heavy discharges it will cause the second horn-gap to discharge and so cut down the arc on the first horn-gap.

The 110,000-volt line equipments were placed in service on August 15th to supply power to Essex Station. The remainder of the equipment is practically all installed and will be placed in operation early in November.

City of Chatham

Designs are being prepared for a station which will be located in Chatham and used to supply a distributing system for the city. Tenders have been requested for two 750-kv-a., three-phase, 26,400/4,000/2,300-volt transformers for the station.

Wallaceburg Distributing Station

To provide for the distribution of power in and around Wallaceburg, in the county of Kent, it was decided to build a station for receiving 26,400-volt power from Kent Transformer Station. Drawings were accordingly prepared for a building, part of which will be used for the station and the remainder as an office for the Wallaceburg Commission. Provision was made for a basement under the office part of the building which will be used as a storehouse for the local commission. The station section will be the same as the standard Type "G." Tenders have been requested from local contractors for the construction of the building and work will be started early in November.

Three 150-kv-a., 26,400/2,300, 575-volt transformers have been purchased from the Canadian General Electric Company, and in accordance with the terms of contract these should have been shipped on October 16th, 1914.

Switching equipment for one 26,400-volt incoming line; one 250-kv-a., 4,000-volt, three-phase, 4-wire, grounded neutral power feeder and one lighting feeder has been purchased from the Canadian Westinghouse Company, and according to the terms of the contract should have been shipped on October 13th.

Tilbury Distributing Station

Tenders have been requested for a building, part of which will be used as a station for receiving 26,400-volt power from Kent Station and the remainder as an office for the Tilbury Hydro-Electric Commission. The station will be similar to the standard Type "G" station, and will contain Westinghouse switching equipment for one 26,400-volt line; one 300-kv-a., 4,000-volt, three-phase, 4-wire feeder to Tilbury and one 150-kv-a. feeder to Comber, together with three Canadian General Electric, 100-kv-a., 26,400/2,300/575-volt transformers.

Dresden Distributing Station

A standard Type "H" station layout equipment has been purchased from the Canadian Westinghouse Co. for this station. It consists of switching equipment for one incoming 26,400-volt line from Kent Transformer Station; three 75-kv-a., 26,400/2,300/575-volt transformers and one 100-kv-a., three-phase, 4-wire grounded neutral feeder. The building will be built and the apparatus installed during November.

ESSEX TRANSFORMER STATION

This station was placed in operation on the 15th of August, and is now supplying power at 26,400 volts to municipal stations at Windsor and Walkerville.

Walkerville Municipal Station

The Walkerville Hydro-Electric Power Commission was supplied on October 29th, 1914, with 26,400-volt power. This was metered on the low-tension side of power transformers and transmitted from Essex Station.

The local distributing station is owned by the municipality of Walkerville, but the engineering in connection with it was performed by the Commission, who submitted their recommendations to the Walkerville Commission for their approval. H. G. Christman & Co., of Hamilton, who built the Essex Transformer Station, was awarded the contract for constructing the building.

The station has an ultimate capacity of four 750-kv-a., three-phase transformers; two 26,400-volt incoming lines and nine three-phase, 4,000-volt feeders.

The present installation does not include the fourth transformer or the ninth feeder.

The 26,400-volt lines are protected by Westinghouse lightning arresters and choke coils and controlled by Type "E" three-phase, series trip, oil circuit breakers and Type "M" disconnecting switches. The oil switches are automatic through series trip, inverse time limit overload relays operating 110-volt 25-cycle tripping coils. The 26,400-volt bus is an open one and is connected to the transformers through disconnecting switches only, although provision has been made for an oil switch also if operating conditions necessitate it. The three transformers were furnished and erected by the Canadian Crocker Wheeler Co., St. Catharines.

The secondaries of the transformers are connected to the 4,000-volt bus through Westinghouse Type "B" oil current breakers, which are made automatic by current transformers and Type "B" inverse time limit, overload relays.

The 4,000-volt bus is located behind the switchboard panels and is sectionalized by disconnecting switches. One half of the bus is fed by two transformers and delivers power to four three-phase, lighting feeders through a Canadian General Electric, 50-kv-a., three-phase, automatic, induction regulator. The other half of bus is fed at present by one transformer and is to be supplied also from the fourth transformer when it is installed. Four power-feeders are supplied from this part of bus. The meter equipment in this station consists of an ammeter in each feeder and in each of the transformer secondaries, together with one voltmeter connected to either part of the bus. The station load is totalized by one graphic recording watt meter and one graphic recording power-factor meter on the 4,000-volt side of the 750-kv-a. transformers. The secondaries of the current transformers are connected in parallel to the one set of meter elements.

The arrangement of this station consists of a main floor, basement and first floor. All the 26,400-volt equipment is located on the first floor. The switchboard

transformers and all 4,000-volt equipment cover about two-thirds of the main floor, while the remainder is partitioned off and is to be used as an office by the Walkerville Commission. The basement will be used for the transformer circulating water pumps, etc., and also as a storehouse.

Windsor Municipal Station

A station, similar to that at Walkerville, was constructed and placed in service on August 15th, 1914, at Windsor. This station has at present only two 750-kv-a., three-phase transformers; three power feeders, and three multiple lighting system feeders, which latter are fed through a 90-kv-a., three-phase, induction regulator. A series lighting system is also used here, and consists of twelve two-wire feeders from a three-phase, 4-conductor bus which is connected through an oil switch to the main 4,000-volt bus. Each series lighting feeder has a 28-kw., 6.6 amp., constant current regulator and is controlled on the primary side by a double pole, single throw, non-automatic switch and by a switch plug on the secondary side.

This station has a graphic recording polyphase wattmeter for metering the power feeders, another for the multiple lighting feeders, and a third for the series lighting feeders.

The Canadian Crocker Wheeler Co. furnished and erected the two 750-kv-a., three-phase, 26,400/4,000/2,300-volt oil immersed, water cooled transformers, and the Canadian General Electric Co. supplied the 90-kv-a., potential regulator, which was installed in the station by the Windsor Commission. The Canadian Westinghouse Co. supplied and installed the switching equipment and made connections to all the above apparatus.

Severn System

Barrie Distributing Station

Disconnecting switches and connecting material have been purchased for connecting a second 22,000-volt incoming three-phase line to the station bus. This apparatus will be installed in November by the Commission.

Collingwood Distributing Station

The second 22,000-volt, three-phase line will be connected to this station in November.

Stayner Distributing Station

A second feeder has been added to this station to supply power at 4,000 volts to Creemore, which is only a few miles distant. The feeder capacity is 200-kv-a. The apparatus, including panel, meters, oil switch, etc., was furnished by the Canadian Westinghouse Company and installed by the Commission.

Port McNicoll Distributing Station

A brick station, with a metal roof, similar to the standard Type "E" was built by Mr. J. Russell, a local contractor. The equipment was supplied by the Canadian General Electric Company for one incoming 22,000-volt, three-phase line, two 25-kv-a., single-phase transformers and one outgoing 2,300-volt, 100-kv-a., light and power feeder. A three-pole, horn gap, air break, disconnecting switch for disconnecting the high-tension line is mounted on a pole outside the station.

All the electrical apparatus is to be installed by the Commission and will be placed in service about the end of November.

Essex Transformer Station

Standard Type "E" Station—Woodbridge

Waubaushene Distributing Station

A duplicate of the Port McNicoll Station and equipment will be placed in service in Waubaushene the latter part of November.

Wasdell's Falls System

Generating Station

This station, with the equipment which was described in the last report, was placed in operation in September, and is now supplying power to Beaverton and Cannington.

Beaverton Distributing Station

Beaverton has generated electric power by steam for several years, but it decided by a municipal vote to take power from the Commission, which has installed electrical equipment in a part of the steam station building, after the latter had been re-modelled.

The equipment was purchased from the Canadian Westinghouse Co., and consists of three 100-kv-a., single-phase, 22,000/2,300-volt, self-cooled transformers and switching equipment for controlling one incoming 22,000-volt, three-phase line and two outgoing 200-kv-a., 4,000-volt, three-phase, 4-wire, grounded neutral feeders. One feeder supplies Beaverton, and the other Brechin and Gamebridge.

Cannington Distributing Station

A brick distributing station with inside dimensions of 18 ft. by 23 ft. by 15 ft. 2 in. was built during the year by Mr. H. G. Wynes, of Collingwood, adjacent to the Town Hall. The electrical equipment was purchased from the Canadian Westinghouse Company at the same time as the equipment for the Beaverton and Winchester Stations, so that it was possible to purchase at a much lower price than if the equipment for each station had been bought separately.

There are at present installed one 22,000-volt, three-phase incoming line with provision for a second; three 100-kv-a., 22,000/2,300-volt, single-phase transformers and three 4,000-volt, three-phase outgoing feeders. The 22,000-volt line is controlled by a Type "E," hand-operated automatic oil switch and protected by choke coils and multigap lightning arresters.

The low-tension side of the transformers is connected direct to the bus, while each feeder is controlled by a Type "B" automatic hand-operated oil switch for switchboard mounting and protected by Type "S" multigap lightning arresters.

The metering equipment consists of an ammeter with ammeter switches, a voltmeter on the power transformer secondaries, a graphic recording wattmeter, an indicating power-factor meter, and an ammeter on each feeder.

This station was placed in service about the 1st of October.

Eugenia System

Generating Station

This station is now being constructed on the Beaver River, about seven and one-half miles from Flesherton, Ont., and will generate power for distribution to Owen Sound, Durham, Chatsworth, Markdale, Flesherton, and other points in and around the counties of Grey and Bruce.

The building, as now being constructed, will only accommodate the present equipment, but provision is being made to allow for doubling the building and equipment when the load requires it. The transformers and switchboard are located

on the main floor with the waterwheels and generators whereas the 22,000-volt equipment is located in a gallery above the switchboard and transformers. The air compressor, water pumps, oil tanks, oil filter, service lighting transformers, and storage battery are located in the basement.

Specifications were issued in July for two 1,200-kw., at 85 per cent. power-factor, 900 r.p.m., three-phase, 60-cycle, 4,000-volt, horizontal type, waterwheel generators. The temperature rise of any part after a continuous run for 24 hours at 1,200-kw. load, normal speed and voltage, 85 per cent. power-factor (lagging), is guaranteed not to exceed the temperature of the surrounding air referred to a room temperature of 25 deg. cent. by more than 40 deg. cent. Immediately following the above run, a two hour run at 1,500 kw. load, normal speed and voltage, and at 85 per cent. power-factor (lagging) shall be made, and the corresponding temperature rise of any part shall not exceed 55 deg. cent. Each generator shall be capable of withstanding a short circuit at terminals for one minute with excitation necessary to give rated terminal voltage at 1,500 kw. load, 85 per cent. power-factor (lagging) and normal speed, without displacing the windings and without injury from overheating or other causes to any part of the generator. Each generator shall be capable of standing an overspeed test at 185 per cent. of normal speed for fifteen minutes with excitation, the same as in short circuit test above, without injury due to mechanical stresses, voltage rises, or other causes. Tenders were received, and after a very careful comparison it was decided early in October to place the contract with the Canadian Westinghouse Co., of Hamilton, which guaranteed to deliver the apparatus on or before February 25th, 1915.

Specifications for the switching equipment were issued in October and the tenders are being received.

Owen Sound Distributing Station

Tenders have been received for three 400-kv-a., single-phase, 22,000/2,300-volt, transformers, and the necessary switching equipment for a standard Type "G" station.

St. Lawrence System

Winchester Distributing Station

A standard 26,400-volt distributing station, similar to that built at Cannington, was constructed at Winchester under contract by H. G. Wynes, of Collingwood, to supply power to Chesterville and Winchester.

The present transformer equipment consists of three 50-kv-a., 26,400/2,300-volt, single-phase, transformers, which were purchased from the Canadian General Electric Co. The switching equipment controlling one incoming 26,400-volt, three-phase line; one 100-kv-a., 4,000-volt three-phase, feeder to Chesterville and one 150-kv-a., 3,000-volt feeder for Winchester, was purchased from the Canadian Westinghouse Co. This station was placed in service on April 18th, 1914.

Brockville Municipal Station

Three 200-kv-a., 26,000/2,300/575-volt single-phase, transformers have been purchased from the Canadian General Electric Co., for this station. Delivery is promised for January, 1915.

Office Building

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Tenders have also been requested for switching equipment similar to that employed with the standard Type "G" stations.

Drawings are being made up to cover an extension to the present steam plant building 18 ft. 6 in. by 36 ft. 1 in. by 25 ft. inside dimensions.

Port Arthur System

Corporation of Port Arthur

Acting at the request of the Commissioner of Utilities at Port Arthur the Commission placed an order with the Canadian Westinghouse Co. for one three-phase, 22,000-volt, low equivalent lightning arrester; three choke coils; six disconnecting switches, and one Type "E" automatic hand-operated remote control circuit-breaker, with series inverse time limit overload trip coils and panel. This equipment was required in the waterworks substation and was shipped in June, 1914.

Tenders were also requested for four 400-kv-a., 22,000/2,300/575-volt, single-phase, water-cooled, 60-cycle transformers for the waterworks substation. It was recommended that Port Arthur purchase these transformers from the Canadian General Electric Co. This recommendation was followed and the Commission was instructed to prepare a contract between the Corporation of Port Arthur and the Canadian General Electric Co., and also to inspect the transformers in the factory before shipment, which was made on July 30th, 1914.

Electric Railway Systems

London and Port Stanley Electric Railway

Preliminary plans for two substations, for the electrical equipment of the London and Port Stanley Electric Railway, which are to be located at the Horton Street substation of the London Water and Light Commission, and in an extension to the Commission's high-tension transformer station at St. Thomas were prepared and specifications issued covering the purchase for each station of two 500-kw., 1,500-volt d.c., 25-cycle rotary converters with the necessary transformers and 13,200-volt a.c. and 1,500-volt d.c. switchboard equipment. Tenders were received for this apparatus, and, after careful consideration, the contract for the rotary converters, the necessary transformers, and the switching equipment for the two substations was placed with the Canadian Westinghouse Company, Limited. Provision is made in the design of the stations for addition, rotary converters, and feeders in order to take care of further developments in the railway's business. The Horton Street station in London is already constructed and plans and specifications are being prepared for the necessary extension to the Commission's transformer station at St. Thomas. The equipment will be installed by the Commission under the supervision of the contractor's engineer.

London Street Railway

For the purpose of supplying direct-current power to the London Street Railway the Board of Water and Light Commissioners of London called for tenders on two 500-kw., 600-volt rotary converters with two banks of 13,200-volt, 25-cycle transformers and the necessary direct-current and alternating-current switching equipment. These tenders were referred to the Commission for their recommendation, and after checking them carefully the Commission recommended that the

contract be awarded to the Canadian General Electric Company. The contract was prepared and the apparatus inspected during the process of manufacture by the Commission. The rotary converters, transformers and the switching equipment were installed in the extension to the Horton Street substation by the local staff.

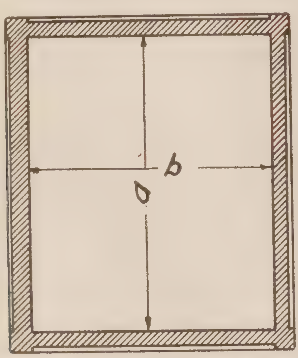
Office Building

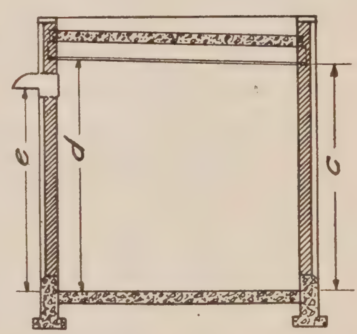
Designs were prepared for a six-storey and basement office building, sufficiently spacious for the needs of the Commission, which is to be erected on a lot with a frontage of 100 feet and a depth of 140 feet, purchased during the year on University Ave. Tenders for the erection of this building were also requested. The contract for the work was awarded to Messrs. Witchall & Son, of Toronto, on October 30th, 1914, who are proceeding with the work.

Distributing Station Standardization

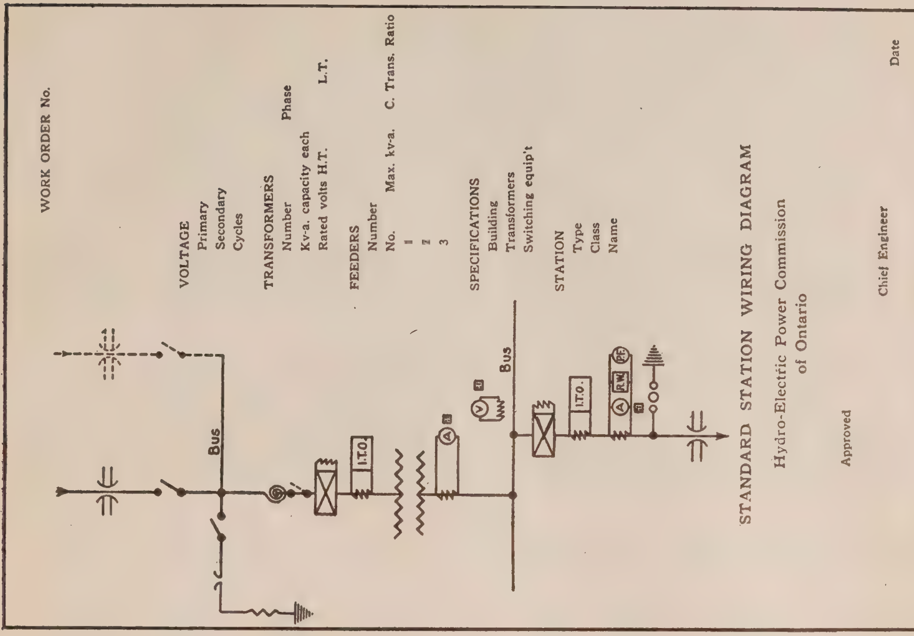
Many of the distributing stations are required to meet similar demands, and are therefore almost identical in arrangement.

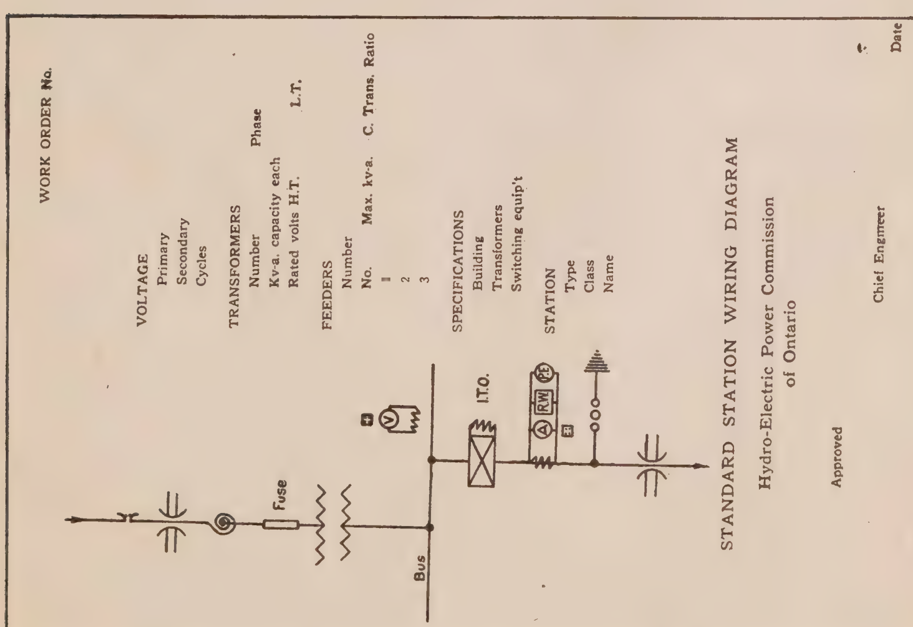
With the idea of standardizing these stations the Commission has prepared building drawings and electrical drawings for several standard layouts, and each type of station is represented by a letter, as shown in the following drawings and table:—





Type	a	b	c	d	e	Volts H.T.	Volts L.T.	Trans Kv-a.	H.T. Entr.	L.T. Entr.	Building Drawing	Electrical Layout
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.							
A	11–0	11–0	9–9	12–6	11–2	13,200	2200	3–25	3	6	3–S –14031	4–S –14032
B	18–0	13–0	12–6	13–0	12–5	13,200	4000Y / 2200Δ	3–50	3	9	4–S –14028	4–S –14033
C	20–0	15–0	13–6	14–0	13–6	13,200	4000Y / 2200Δ	3–75	3	9	4–S –14026	4–S –14027
D D1	20–0	15–0	13–9	14–3	13–6	13,200	4000Y / 2200Δ	3–150	6	9	4–S –14067	4–S –14062 ....
E E1	15–0	12–0	12–9¼	14–5½	12–5	13,200	4000Y / 2200Δ	3–150	3	6	4–S –14111 4–S –14137	3–S –14106 3–S –14106
F F1	15–0	12–0	12–9¼	14–5½	12–5	22,000	2200Δ	3–150	3	6	4–S –14111 4–S –14137	3–S –14110 3–S –14110
G G1	23–0	18–0	14–7	15–2	14–5	26,400	4000Y / 2200Δ	3–150	6	9	4–S –14150 4–S –14151	4–S –14142 4–S –14117
H H1	15–8	13–0	15–1¾	15–3⅜	13–8	26,400	4000Y / 2200Δ	3–150	3	9	4–S –14140	4–S –14134 ....





Standard Station Wiring Diagrams

Types "E," "F" and "H" have no inside high-tension oil switch or lightning arrester but are provided instead with a horn type, air break disconnecting switch mounted on a pole outside the station, and a choke coil and disconnecting switch fuses inside the station. Type "E1" differs from "E" in that the building has a concrete roof, whereas "E" has a corrugated iron roof. "G1" building is the reverse of "G," that is, the entrances are on the opposite side with respect to the door. The "G1" electrical layout is also reversed. Such differences as those between "G" and "G1" are necessary because of local conditions, which in this particular case required that the lines come in on the site in a certain way with respect to the entrance to the building.

A building standard specification and an equipment standard specification were prepared to cover any one of these stations. The accompanying illustrations represent two of the standard wiring diagrams that were prepared.

A set of the electrical layout drawings and a copy of the electrical specifications were forwarded to each of the manufacturers. These are kept on file for reference. When tenders are requested, a copy of the wiring diagram with the blanks filled in, is sent with a letter to the manufacturer. This is sufficient to give him the necessary information for submitting his tender.

LOW-TENSION TRANSMISSION LINES

On October 31st, 1914, there were completed or under construction 800 miles of low-tension transmission lines of voltages varying from 46,000 volts to 2,200 volts. This figure includes 16.43 miles of steel lattice pole line. The mileage of these lines is distributed among the various systems as follows:

Niagara System—609.68 miles.
St. Lawrence System—60.77 miles.
Simcoe System—80.15 miles.
Wasdell's Falls System—49.19 miles.

In the construction of these lines, 5,600 miles of wire weighing 3,450,000 lb., 33,000 wood poles and 383 steel towers were used.

On the transmission line poles 685 miles of a single circuit telephone line has been erected for use in operating the system.

During the year 17 gangs were employed, two of which, under the direction of a forestry expert, were employed solely in trimming trees. These gangs constructed 243 miles of transmission line as well as distribution systems in 19 towns and villages and rural lines in 8 townships.

For the above lines about 200 crossing plans were prepared, and submitted to the telephone and railway companies for approval.

Low-tension distributing systems were constructed by the Commission in the towns and villages of Thamesford, Thorndale, Creemore, Cannington, Gamebridge, Brechin, Woodville, Sunderland, Elora, Fergus, Ayr, Drumbo, Plattsville, Princeton, Lucan, Embro, Woodbridge, Milton and Bolton, and rural lines in the townships of E. Flamboro, Waterloo, Norwich, Toronto, Etobicoke, York, Grantham and Brant.

The mileage of lines tabulated according to the voltage and number of circuits is as follows:

Voltage	Single Circuit Totals			Double Circuit Totals			Single and Double Circuits Totals		
	Total Oct. 31, 1913	October 31, 1913, to Oct. 31, 1914	Total Oct. 31, 1914	Total Oct. 31, 1913	October 31, 1913, to Oct. 31, 1914	Total Oct. 31, 1914	Total Oct. 31, 1913	October 31, 1913, to Oct. 31, 1914	Total Oct. 31, 1914
46,000	1.93	....	1.93	15.50	....	15.50	17.43	....	17.43
26,400	......	94.50	94.50	59.50	7.17	66.67	59.50	101.67	161.17
22,000	89.99	16.00	105.99	63.90	....	63.90	153.89	16.00	169.89
13,200	161.77	96.25	258.02	115.79	....	115.79	277.56	96.25	373.81
6,600	6.52	....	6.52	5.79	....	5.79	12.31	....	12.31
4,000	22.80	29.67	52.47	......	....	....	22.80	29.67	52.47
2,200	10.35	.75	11.10	1.61	....	1.61	11.96	.75	12.71
Totals	293.36	237.17	530.53	262.09	7.17	269.26	555.45	244.34	799.79

Description of Lines

NIAGARA SYSTEM

Sec. No.	From	To	Miles	No. of Poles	Voltage	No. of Circuits	Power Cables B. & S. Gauge	Telephone Wires, B. & S. Gauge	Work Commenced	Work Completed	In Operation
L.T. 1	Dundas Sub H.E.P.C. ..	Junction Pole No. 134..	2.84	134	13,200	2	No. 1/0 Alum	10 Copper	July 13, 1910	Jan. 2, 1911	
2	Junction Pole No. 134..	Beach Pump House....	6.34	323	"	2	1/0 "	10 "	July 13, "	Jan. 2, "	
3	" " No. 134..	Asylum	1.13	67	"	1	2 "	10 "	Dec. 5, "	Feb. 8, "	
4	Berlin Sub. H.E.P.C. ...	Junction Pole No. 10...	.18	10	"	2	1/0 "	10 "	Aug. 25, "	Sept.11, 1910	
5	Junction Pole No. 10...	Waterloo	1.64	78	"	2	1/0 "	10 "	Sept.11, "	Nov. 25, "	
6	" " No. 10...	Berlin Corp. Station...	.76	35	"	2	1/0 "	10 "	Aug. 25, "	Sept.11, "	
7	Berlin Sub. H.E.P.C....	New Hamburg	12.27	556	"	2	2 "	10 "	Sept. 11. "	Jan. 2, 1911	Feb. 3,1911
8	Woodstock " ...	Ingersoll	9.90	455	"	2	1/0 "	10 "	Nov. 14, "	Mar. 28, "	
9	" " ...	Junction Pole No. 508..	11.12	508	"	2	1/0 "	10 "	Jan. 2, 1911	Apr. 29, "	
10	Junction Pole 508	Tillsonburg	10.30	467	"	2	1/0 "	10 "	Jan. 2, "	Apr. 29, "	
11	" " 508	Norwich	4.59	207	"	1	2 "	10 "	Feb. 13, "	Mar. 30 "	
12	St. Thomas Sub.H.E.P.C	St. Thomas Corp. Stn...	1.13	50	"	2	1/0 "	10 "	Dec. 14, 1910	Dec. 30, 1910	
13	Stratford " ..	Stratford " ..	1.75	78	"	1	2 Copper	10 "	Built by Cor	poration	
14	Preston " ..	Junction Pole No. 99...	2.04	99	6,600	3	{ 1-2Alum 2-4/0 "	10 "	Oct. 8, 1910	Jan. 19, 1911	
15	Junction Pole No. 99...	Hespeler	2.08	99	"	1	2 Alum	10 "	Oct. 8, "	Dec. 30, 1910	
16	" " 99...	Galt..................	3.75	173	"	2	4/0 "	10 "	Oct. 8, "	Jan. 19, 1911	
17	Preston Sub H.E.P.C...	Preston Corp. Station..	.14	11	"	1	2 Copper	10 "	Built by Cor	poration.	
		These poles also carry Section L.T. 35 circuits to G. P. H. Railway Sub.									
18	London Sub.	Junction Pole No. 38..	.79	38	13,200	2	{ 1-3/0 Alum 1-2 "	10 Copper	Oct. 26, 1910	Jan. 10, 1911	
19	Junction Pole No. 38...	Asylum London	1.54	70	"	1	2 "	10 "	Oct. 26, "	Jan. 19. "	
20	" " 38...	Junction Pole No. 93..	1.22	55	"	1	3/0 "	10 "	Oct. 24, "	Jan. 21, "	
21	London Sub. H.E.P.C...	London Sub. No. 1.....	3.56	178	"	1	3/0 "	10 "	Oct. 20, "	Jan. 20, "	
22	Junction Pole No. 93...	" " 1....	1.71	96	"	2	{ 1-3/0 " 1-1/0 "	10 "	Dec. 23, "	Jan. 20, "	
23	" " 93...	" " 2....	.31	20	"	1	1/0 "	10 "	Dec. 23, "	Jan. 20, "	
24	London Sub. No. 1	Springbank...........	3.55	156	"	1	1/0 "	10 "	Jan. 1, 1911	Jan, 7, "	
25	Dundas Sub. H.E.P.C..	Dundas Town	.98	58	2,200	1	{ 400 M.c.m. 250 M.c.m.	Alum Copper	Dec. 1, 1910	Jan. 1, "	
26	Cooksville Sub. H.E.P.C.	Port Credit L.S. Road	2.74	129	13,200	2	2 Alum	10 Copper	Feb. 24, 1911	July 10, "	
26a	Pt. Credit L.S. Road..	Pt. Credit Brick Wks..	.24	14	"	2	2 "	10 "	Apr. 5, "	July 23 "	
27	Cooksville Sub. H.E.P.C.	Brampton	11.24	510	"	2	2 "	10 "	Feb. 15, "	May 6, "	
		These poles also carry Section L.T. 34 Circuits from poles No. 1 to 89—1.94 miles									
28	Stratford Sub. H.E.P.C.	Junction Pole No. 648..	14.39	648	13,200	2	2 Alum	10 Copper	Apr. 6, 1911	Aug. 4, 1911	
		These Circuits carried on Sec. L.T. 13 poles Nos. 2 to 24, inclusive, Sec. L.T. 28 carries L.T. 67 circuits.									

29	Junction Pole No. 648..	Seaforth	12.86	581	13,200	2	2 Alum	10 Copper	Mar. 25, 1911	Sept.13, 1911	
	Sec. L.T. 29 carries L.T. 67 circuits to Seaforth Jct. Pole 1153.										
30	" " 648..	Mitchell	1.27	63	"	2	2 "	10 Copper	Mar. 24, 1911	Aug. 3, "	
31	Guelph Sub. H.E.P.C...	O. A. College	1.56	77	"	1	1/0 "	10 "	July 21, "	Nov. 9, "	
32	" H.E.P.C.Sub. Prop.	....	.09	8	550D.C.	1	Municipal lines				
					2,200A.C.	4					
					13,200A.C.	3	1/0 Alum	10 "	Aug. 7, 1911	Sept. 3, 1911	Sept.4,1911
	18 poles on Station Property in all.										
34	Cooksville Sub. H.E.P.C.	Weston	14.07	551	13,200	2	2 Alum	8 "	Apr. 19, "	July 24, "	
	These Circuits carried on Section L.T. 27 poles, 1 to 89, inclusive										
35	Preston Sub. H.E.P.C..	G. P. & H. Ry.	.12	6	6,600	1	1/0 Alum	10 "	Mar. 13, "	Mar. 21, "	
	These Circuits carried on Sections L.T, 17 poles, 1 to 11, inclusive										
36	Jct. Pole No. 84, Port Credit	Mimico (New Toronto)	5.75	266	13,200	1	2 Alum	8 "	Apr. 26, "	Feb. 29, 1912	
38	Dundas Sub. H.E.P.C...	Dom. Sewer Pipe Wks.	7.35	350	"	1	2 "	8 "	July 21, "	Dec. 19, 1911	Apr. 6,1912
39	Hamilton Asylum P.H..	Hamilton Asylum	.63	30	2,200	2	4 Copper	10 "	Sept. 26, "	Oct, 27, "	Apr. 6, "
40	Junction Pole No. 260..	Waterdown	1.50	72	13,200	1	2 Alum	8 "	Sept. 30, "	Oct. 10, "	Apr. 6, "
40a	Dom. Sewer Pipe Wks.	Junction Pole No. 260..	1.92	....	"	1	2 "	8 "	Sept. 30, "	Oct. 7, "	Mar. 1, "
41	St. Thos. Sub. H.E.P.C.	Port Stanley	12.27	573	"	1	2 "	8 "	Oct. 16, "	Mar. 8, 1912	Mar. 9, "
42	Junct. Pole, Sec. L.T. 48 at Beachville	Standard White Lime Co.	1.00	2	2,200	1	2 "	....	....	....	....
	These circuits carried on Section L.T. 8 poles, from Beachville pole 290 to pole 240.										
43	Dundas Sub. H.E.P.C..	Jno. Bertram & Son ...	1.21	10	13,200	1	2 Alum	10 Copper	Dec. 1, 1911	Dec. 19, 1911	Dec. 21, '11
	These Circuits carried on Section L.T. 25 poles, 1 to 58 inclusive.—.98 miles										
45	Jct. Pole No. L.T. 8-240	Beachville	.09	3	13,200	1	1/0 Alum	8 Copper	June 1, 1912	June 29, 1912	July 17, '12
46	St. Mary's Sub.	St. Mary's Cement Wks.	2.22	80	"	1	3/0 "	8 "	July 15, "	Aug. 19, "	Sep. 7, "
47	Dundas Sub.	Caledonia	14.36	674	"	1	3/0 "	8 "	May 10, "	Sep. 18, "	" 20, "
47a	Caledonia	Paris Alabastine Co...	.22	....	2,200	1	2/0 Copper	....	Sep. 5, "	Sep. 18, "	" 20, "
	These Circuits carried on Section L.T. 49 poles.										
48	Caledonia	Junction Pole No. 940..	5.87	267	13,200	1	3/0 Alum	8 Copper	June 22, "	Sep. 18, "	Sep. 20, '12
49	Junction Pole No. 940..	Hagersville	3.79	176	"	1	2 "	10 "	Feb. 28, 1913	May 2, 1913	Aug. 15, '13
50	" " 940..	Lythmore	4.98	230	"	1	3/0 "	8 "	June 15, 1912	Sep. 18, 1912	Sep. 20, "
55	St. Thomas Sub. H.E.P.C	L.L.E. Ry. Sub.	1.68	88	"	1	2 "	8 "	Aug. 9, "	Oct. 11, "	Oct. 27, "
56	Port Credit	Toronto Golf Club	3.24	11	2,200	1	6 D.B.W.P. Copper ...		June 10, "	Aug. 3, "	Aug. 6, "
	Carried on L.T. 36 poles.										
56e	Extension from Sect. L.T. 56 on T.G.C. prop.		.90	37	2,200	1	6 "	....	Nov. 22, "	Jan. 3, 1913	Dec. 24, "
57	O. A. College	Guelph Prison Farm, Pole 156	1.93	86	13,200	1	2 Alum	8 Copper	Aug. 19, "	Dec. 14, 1912	Dec. 14, "
57a	Guelph Prison Farm ..	Property	.08	4	"	1	2 "	10 "	May 14, 1913	May 19, 1913	Sep. 4 '13
58	Guelph Prison Farm, Pole 156	Junction Pole No. 454..	6.42	297	"	1	2 "	8 "	Aug. 19, 1912	Dec. 14, 1912	Dec. 14,'12
59	Junction Pole No. 454..	Acton	5.82	268	"	1	2 "	8 "	" 19, 1912	Dec. 14, 1912	Dec. 14, "
60	St. Catharines	Port Dalhousie	3.18	142	2,200	1	1/0 "	....	Oct. 16, 1912	Nov. 21, "	Nov. 17, "
61	Caledonia Sub.	Caledonia	.30	....	"	1	4 D.B.W.P. Copper ...		Nov. 20, 1912	Nov. 30, "	Nov. 30, "
	Carried on Section L.T. 50 poles.										

NIAGARA SYSTEM—Continued

Sec. No. L.T.	From	To	Miles	No. of Poles	Voltage	No. of Circuits	Power Cable B.&S. Gauge	Telephone Wires. B. & S. Gauge	Work Commenced	Work Completed	In Operation
62	Jct. Pole L.T. 27-230 ..	Milton	16.65	740	13,200	1	3/0 Alum	10	Nov. 25, 1912	Mar. 13, 1913	Mar. 13, '13
63	Preston Sub.	Doon Twine Mill	4.18	208	6,600	1	2 "	....	Dec. 2, 1912	Apl. 11, "	Apl. 1, "
		Carried on Section L.T. 17 poles, No. 1 to 17, inclusive.									
64	Mimico Sub.	Mimico Asylum	1.51	17	2,200	1	2 Copper	....	Mar. 30, 1912	Feb. 3, "	Apl. 26, "
		Carried on Section L.T., 36 poles									
65	Acton	Georgetown	9.03	411	13,200	1	3/0 Alum	10	Mar. 11, 1913	Aug. 1, "	Aug. 1, "
66	Junction Pole No. 454..	Rockwood	1.64	77	"	1	2 "	10CC.Steel	May 6, 1913	July 3, "	Aug. 1, "
67	Stratford Sub. H.E.P.C.	Goderich	48.36	1,007	26,400	2	3/0 "	"	Apr. 23, 1913	June 9, 1914	Dec. 23. "
		Carried on Section L.T. 28 and L.T. 29 poles, to Seaforth Junction from Stratford.									
68	Brant Station	Paris	3.21	152	26,400	2	3/0 Alum	10CC.Steel	Nov. 11, 1913	Jan. 2, "	Jan. 3, '14
69	" "	Brantford	6.66	320	26,400	2	3/0 "	"	Dec. 15, 1913	Jan. 17, "	Jan. 17. "
71	Waterloo	Elmira	10.93	518	13,200	1	2 "	"	May 17, 1913	Oct. 14, 1913	Oct. 25, '13
72	Preston	**Breslau**................	6.48	293	6,600	1	2 "	"	Apr. 4, 1913	ec. 23, 1913	Dec. 23, '13
73	Niagara Falls	Jct. Pole 113	5.00	113	46,000	3	4/0 Copper	8	Mar. 5, 1914		Aug. 20,'14
74	Jct. Pole 113	Union Carbide Co. ..	10.50	235	46,000	3	4/0 "	8	Mar. 5, 1914	Steel	Aug. 20,'14
75	Jct. Pole 303	Electric Steel & Metal Co.	1.93	45	46,000	1	2/0 "	8	July 11, 1914	Towers.	Oct. 17, '14
76	Junction Pole	**Crumlin Junction**	5.31	218	13,200	1	2 Alum	....	Sept.18, 1913	May 8, 1913	Jan. 27, '14
77	**Crumlin Junction**......	Thorndale	7.91	310	"	1	2 "	....	Oct. 10, 1913	Feb. 6,1914	Feb. 6, "
78	" "	Thamesford	6.85	281	"	1	2 "	....	Oct. 13, 1913	Jan. 19, "	Jan. 27, "
79	**Junction Pole No. 381-62**.	**Streetsville**............	.43	19	"	1	2 "	10CC.Steel	Nov. 1, 1913	Nov. 24,1913	Nov. 24,'13
80	" "	Clinton	1.27	62	26,400	2	3/0 "	"	Sept.20, 1913	Feb. 15,1914	
81	Essex Sta.	Jct. Pole	1.10	55	"	4	3/0 "	10	July 28, 1914	Sept. 6, 1914	Sep. 6, '14
82	Jct. Pole	Windsor	2.27	102	"	2	3/0 "	10	July 31, 1914	Sept.18, 1914	Sep. 18, "
83	Jct. Pole	Walkerville	1.30	61	"	2	3/0 "	10	June 2, 1914	Aug. 1, 1914	Sep. 6, "
84	Kent Sta.	Chatham	2.50	133	"	2	2/0 "	10			
85	Jct. Pole L.T. 57-118 .	Jct. Pole L.T. 85-776..	14.65	658	13,200	1	3/0 "	10	June 3, 1914	Oct. 17, 1914	Oct. 22, "
86	Jct. Pole L.T. 85-776..	Elora	1.10	58	"	1	3/0 "	10	Aug. 18, 1914	Oct. 28, 1914	Oct. 22, "
87	Jct. Pole L.T. 85-776..	Fergus	1.90	93	"	1	3/0 "	10	Aug. 1, 1914	Oct. 13, 1914	Oct. 22, "
88	Paris	Jct. Pole	7.00	301	26,400	1	1/0 "	10	July 21, 1914	Nov. 30, 1914	Dec. 1, "
89	Jct. Pole	Ayr	2.00	90	"	1	1/0 "	10	Sept.15, 1914	Nov. 30, 1914	Dec. 1, "
90	Jct. Pole	Drumbo	8.00	352	"	1	1/0 "	10	July 13, 1914	Nov. 30, 1914	Dec. 1, "
91	Drumbo	Princeton	5.00	215	4,000	1	6 Copper	..	Aug. 17, 1914	Nov. 30, 1914	Dec. 18, "
92	Drumbo	Plattsville	8.00	301	"	1	4 "	..	Aug. 17, 1914	Nov. 30, 1914	Dec. 1, "
					1.00 miles on L.T. 90 poles						
93	Jct. Pole L.T.-77	Deller Bros.	1.00	40	4,000	1	6 Copper	..			
94	Jct. Pole L.T. 65	I. P. B. Co.	5.08	221	13,200	1	1/0 Alum	10	June 10, 1914	June 31, 1914	July 3, "
95	London	Lambeth	10.00	500	"	1	3/0 "	10	Sept. 1, 1914	Nov. 30, 1914	Nov. 30, "
96	Lambeth	**Komoka Jct.**	6.00	300	"	1	3/0 "	10	Oct. 15, 1914	Nov. 30, 1914	Nov. 30, "

97	Komoka Jct.	Mt. Brydges	4.50	225	13,200	1	3/0 "	10	Sept.29, 1914	Nov. 30, 1914	Nov. 30, '14
98	Mt. Brydges	Strathroy	8.00	400	"	1	3/0 "	10	Sept.14, 1914	Nov. 30, 1914	Nov. 30,
99	London	Lucan	19.00	855	"	1	2 S.R. "	10 BWG Galv. Iron	Oct. 23, 1914	Jan. 20, 1915	Jan. 21, '15
101	Kent Sta.	Tilbury	17.00	90	26,400	1	2 S.R. "	10	Jan. 13, 1915		
			15.00 miles on H.T. Telephone Line								
102	Kent Sta.	Jct. L.T. 102	1.50	75	26,400	1	1/0 Alum	10	Oct. 28, 1914	Feb. 3, 1915	Feb. 3, 15
103	Jct. Pole L.T. 102	Jct. Pole L.T. 103	10.00	500	"	1	1/0 "	10	Oct. 30, 1914	Feb. 3, 1915	Feb. 3, "
104	Jct. Pole L.T. 103	Wallaceburg	9.00	450	"	1	1/0 "	10	Nov. 6, 1914	Feb. 3, 1915	Feb. 3, "
105	Jct. Pole L.T. 103	Dresden	7.00	350	"	2	3/0 "	10			
106	Jct. Pole	Embro	7.00	350	13,200	1	1/0 "	10	Oct. 1, 1914	Dec. 24, 1914	Dec. 22, '14
107	Jct. Pole L.T. 34	Woodbridge	7.00	350	"	1	1/0 "	10	Sept.25, 1914	Oct. 21, 1914	Dec. 2, "
108	Woodbridge	Bolton	12.00	600	"	1	3/0 "	10	Oct. 20, 1914	Nov. 26, 1914	Jan. 26, '15
109	Jct. Pole	W. T. & I. Ry.	.02	2	"	1	2 "	10	Sep. 12, 1914	Sep. 12, 1914	Sep. 13, '14
110	Mimico Sub.	Prison Brick Yard ...	.75	36	2,200	1	2/0 Copper	..	Oct. 24, 1914		
111	Brant Sub.	Jct. Pole 111	6.00	240	26,400	1	2 S.R. Alum	10	Nov. 6, 1914		
112	Jct. Pole 111	Burford	4.00	160	"	1	2 S.R. "	10	Nov. 21, 1914		
113	Jct. Pole 111	Waterford	14.00	560	"	1	2 S.R. "	10	Nov. 21, 1914		
114	Waterford	Simcoe	9.00	360	"	1	2 S.R. "	10	Nov. 26, 1914		
115	Tilbury	Comber	8.00	350	4,000	1	1/0 Copper	..			

SEVERN SYSTEM

S.L.											
1	Waubaushene (S.R. & P. Co.)	Jct. Pole (Coldwater) ..	4.29	193	22,000	2	4/0 Alum	10 CC.Steel	Sep. 20, 1912	Feb. 18, 1913	Feb. 24, '13
2	Jct. Pole (Coldwater) ..	Coldwater Sub.	1.16	55	"	1	2 "	"	Sep. 20, 1912	Feb. 18, "	Feb. 24, "
3	" " " ..	Jct. Pole (Elmvale) ..	15.86	710	"	2	4/0 "	"	Sep. 25, 1912	Feb. 18, "	Feb. 24, "
4	" " (Elmvale) ..	Elmvale Sub.	.42	19	"	1	2 "	"	Feb. 1, 1913	May 17, "	May 27, "
5	" " " ..	Jct. Pole (Phelpston) ..	4.55	207	"	2	4/0 "	"	Oct. 20, 1912	Feb. 18, "	Feb. 24, "
6	" " (Phelpston) .	Barrie Sub.	12.27	550	"	2	2/0 "	"	Nov. 6, 1912	Apl. 5, "	April 6, "
7	" " " ..	Jct. Pole (Stayner) ...	15.07	675	"	2	3/0 "	"	Oct. 23, 1912	Feb. 18, "	Feb. 24, "
8	" " (Stayner) ...	Stayner Sub.	1.50	68	"	1	2 "	"	Jan. 24, 1913	Apl. 26, "	Sep. 25, "
9	" " " ...	Collingwood Sub.	11.86	530	"	2	3/0 "	"	Nov. 1, 1912	Feb. 18, "	Feb. 24, "
10	Stayner	Creemore	7.67	348	4,000	1	1/0 "	....	Aug. 15, 1914	Oct. 25, 1914	Oct. 21, '14
15	Jct. Pole L.T. 37	Pt. McNichol	1.00	51	22,000	1	1/0 "	10			
L.T.											
37	Midland (S.R. & P. Co.)	Penetang Sub.	4.50	223	"	1	2 "	10 CC.Steel	June 7, 1911	July 18, 1911	July 18,'11

ST. LAWRENCE SYSTEM

StL.											
1	Morrisburg	Prescott	22.96	1,083	22,000	1	3/0 Alum	10 CC.Steel	Oct. 29, 1912	June 14, 1912	Oct. 23, '13
2	"	Winchester	16.29	747	"	1	3/0 "	"	June 4, 1913	Dec. 15, 1913	Dec. 18, "
3	Winchester	Chesterville	6.52	294	"	1	3/0 "	"	Sept. 6, "	Feb. 17, 1914	Feb. 7, '14
5	Prescott	Brockville	15.00	753	22,000	1	3/0 "	"	Oct. 6, 1914	....	....

WASDELL'S FALLS SYSTEM

Sec. No.	From	To	Miles	No. of Poles	Voltage	No. of Cir-cuits	PowerCables B.&.S Gauge	Telephone Wires B. & S. Gauge	Work Commenced	Work Completed	In Operation
W.L 1	Wasdell's Falls..........	Jct. No. 1..............	25.50	1,203	22,000	1	No. 1/0 Alum	10CC.Steel	Jan. 17, 1914	Sept.28, 1914	Sep. 28, '14
2	Jct. No. 1	Beaverton.,............	1.47	70	22,000	1	No. 1/0 Alum	10CC.Steel	Mar. 30, 1914	"	Sep. 28, "
3	Jct. No. 1	Cannington............	9.67	442	22,000	1	No. 1/0 Alum	10CC.Steel	Feb. 18, 1914	"	Sep. 28, "
4	Beaverton	Gamebridge............	6.50	....	4,000	1	No. 1/0 Alum	....	May 2, 1914	....	Oct. 6, "
					Carried on Secs. W.L. 1 & 2 poles						
5	Gamebridge............	Brechin................	3.75	....	4,000	1	No. 1/0 Alum	....	July 25, 1914	....	Oct. 6, "
					Carried on Sec. W.L. 1 poles						
6	Cannington.............	Woodville..............	5.15	147	4,000	1	No. 1/0 Alum	....	May 19, 1914	....	Oct. 19, "
7	Cannington.............	Sunderland............	7.40	335	4.000	1	No. 1/0 Alum	....	June 1, 1914	July 10, 1914	Oct. 19, "

Total Mileage of Lines and Number of Poles

—	Total to Oct. 31st, 1913	Oct. 31st, 1913, to Oct 31st, 1914	Total to Oct. 31st, 1914
Total mileage low tension lines	555.45	244.34	799.79
Total mileage single circuit lines	293.36	237.17	530.53
Total mileage double circuit lines	262.09	7.17	269.26
Total mileage low tension telephone lines	471.71	213.92	685.63
Total mileage lines completed	357.47	240.07	597.54
Total mileage lines under construction	198.00	....	202.25
Total number of poles	22,458	10,587	33,045

Total Weights and Mileages of Cable

—	Wire Miles			Weight in Pounds		
	Total to Oct. 31st, 1913	Oct. 31st, 1913, to Oct. 31st, 1914	Total to Oct. 31st, 1914	Total to Oct. 31st, 1913	Oct. 31st, 1913, to Oct. 31st 1914.	Total to Oct. 31st, 1914
Aluminum Cable	2,444.19	471.68	2,915.87	1,654,453	322,612	1,977,065
Copper Wire	183.00	71.67	254.67	546,850	87,316	634,166
Copper Clad Steel Wire	990.59	409.33	1,399.92	172,360	63,036	235,396
Galv. Iron Wire	....	39.90	39.90	....	10,374	10,374
Galv. Steel Cable	511.06	243.59	754.65	324,012	154,436	478,448
Reinforced Al. Wire	....	255.21	255.21	....	121,007	121,007
Totals	4,128.84	1,491.38	5,620.22	2,697,675	758,781	3,456,456

Gauge, Length and Weight of Telephone Wire

Gauge	Wire Miles			Weight in Pounds			Mileage Single Circuit Lines		
	Total to Oct. 31, 1913	Oct. 31, 1913, to Oct. 31, 1914	Total to Oct. 31, 1914	Total to Oct. 31, 1913	Oct. 31 1913, to Oct. 31, 1914	Total to Oct. 31, 1914	Total to Oct. 31, 1913	Oct. 31, 1913, to Oct. 31, 1914	Total to Oct. 31, 1914
No. 10 B.W.G. galv. iron	....	39.90	39.90	....	10,374	10,374	....	19.00	19.00
No. 8 B. & S., C.C. steel	217.69	....	217.69	53,334	....	53,334	103.66	....	103.66
No. 10 B. & S., C.C. steel	772.90	409.33	1,182.23	119,026	63,036	182,062	368.05	194.92	562.97
Totals	990.59	449.23	1,439.82	172,360	73,410	245,770	471.71	213.92	685.63

Gauge, Length and Weight of Conductors

Browne and Sharp Gauge	Wire Miles			Weight Pounds			Miles Single Circuit Lines			Miles Double Circuit Lines		
	Total to Oct. 31, 1913	Oct. 31, 1913, to Oct. 31, 1914	Total to Oct. 31, 1914	Total to Oct. 31, 1913	Oct. 31, 1913, to Oct. 31, 1914	Total to Oct. 31, 1914	Total to Oct. 31, 1914	Oct. 31, 1913, to Oct. 31, 1914	Total to Oct. 31, 1914	Total to Oct. 31, 1913	Oct. 31, 1913 to Oct. 31, 1914	Total to Oct. 31, 1914
400,000 c.m. Aluminum	1.67	....	1.67	3,205	....	3,205	.53	....	.53	....	....	....
4/0 Alum..................	192.09	....	192.09	373,423	....	373,423	....	....	....	30.49	....	30.49
3/0 "	879.02	266.14	1,145.16	717,280	217,170	934,450	106.16	73.15	179.31	86.43	5.67	92.10
2/0 "	77.30	....	77.30	47,704	....	47,704	....	....	....	12.27	....	12.27
1/0 "	499.18	205.54	704.72	256,079	105,442	361,521	70.05	65.25	135.30	44.21	....	44.21
2 "	794.93	....	794.93	256,762	....	256,762	114.20	....	114.20	69.08	....	69.08
2 S.R "	....	239.46	239.46	....	115,180	116,180	....	76.02	76.02	....	....	....
4 S.R "	....	15.75	15.75	....	5,827	5,827	....	....	....	....	2.50	2.50
250,000 c.m. Copper...........	1.42	....	1.42	2,043	....	2,043	.45	....	.45	....	....	....
4/0 Copper................	146.47	....	146.47	502,831	....	502,831	15.50	....	15.50	15.50	....	15.50
2/0 "	6.77	2.37	9.14	15,618	5,467	21,085	2.15	.75	2.90	....	....	....
1/0 "	....	25.20	25.20	....	46,569	46,569	....	8.00	8.00	....	....	....
2 "	10.39	....	10.39	13,309	....	13,309	3.30	....	3.30	....	....	....
4 "	4.91	25.20	30.11	4,443	22,806	27,249	.30	8.00	8.30	.63	....	.65
6 "	13.04	18.90	31.94	8,606	12,474	21,080	4.14	6.00	10.14	....	....	....
Totals....................	2,627.19	798.56	3,425.75	2,201,303	530,935	2,732,238	316.78	237.17	553.95	258.61	8.17	266.78

SECTION III

OPERATION OF THE SYSTEMS

NIAGARA SYSTEM

The general operation of the Niagara System for the past fiscal year has been very satisfactory. The power supply furnished the Commission by the Ontario Power Company has been practically continuous throughout the year. The Company has set apart a section of their equipment for the sole use of the Commission to admit of correction for voltage variation during periods of light load and to insure continuous service.

The greatly reduced number of high-tension interruptions which may be attributed to insulator trouble without doubt, indicate the efficiency of the system devised during the previous year to eliminate defective insulators from the line. During the past year all the insulators on the entire system have been twice subjected to this "test" and the defective units immediately replaced. It is believed that trouble in the future from this source will thus be entirely eliminated.

During the year thirty-three different electrical storms were reported over the system, of these ten were severe and the balance moderate. The first storm occurred on March 25th and the last on October the 10th. Seven of these storms traversed the entire system, while the remainder were distributed mainly along the north side of the Western Loop.

This year, as in preceding years, Cooksville and St. Mary's appear to be the vicinities in which the electrical storms are more prevalent and severe than on other parts of the Commission's system. There were only two total interruptions of the service during the past year, these were due to lightning and only momentary.

The high-tension transmission line is in good condition at the present time and the cable required little or no attention during the past year. There are now two new circuits of No. 6/0 B. & S. gauge steel-reinforced aluminum cable between Dundas and London. The work of stringing the new cable and taking down the old single circuit No. 3/0 B. & S. gauge aluminum cable having been carried out by the Operating Department. The presence of three separate circuits between Dundas and London has done much to increase the flexibility of the operation of the system and the reliability of the service. The operating characteristics of the steel-reinforced aluminum cable have, up to the present time, fully confirmed the advantage expected from the adoption of this cable in preference to the straight aluminum cable heretofore used. The new section of high-tension transmission line between St. Thomas and Windsor was put into permanent service on August 16th, after the usual preliminary tests had been satisfactorily concluded. The municipalities of Windsor and Walkerville were supplied with power on August 20th and 28th respectively. This increases the distance of high-tension transmission of power on the Niagara System from 171 miles to 274 miles.

The low-tension lines on the Niagara System have given satisfactory operation. the installation of sectionalizing and tap switches having greatly facilitated the maintenance of power supply and increased the efficiency of operation.

The low-tension lines from Stratford to Seaforth and Mitchell and also from Dundas to Hamilton were gone over and straightened and the sags readjusted where necessary.

The electrical and mechanical equipment of the high-tension stations is in first-class condition and is operating very satisfactorily. During the year all of the high and low-tension oil circuit breakers have been overhauled, the oil filtered and contacts renewed.

The installation of the emergency high-tension bus bars in the various stations has been continued, and now all stations are so equipped that a single operator can put the spare transformer into circuit in the place of any damaged one in a very few minutes.

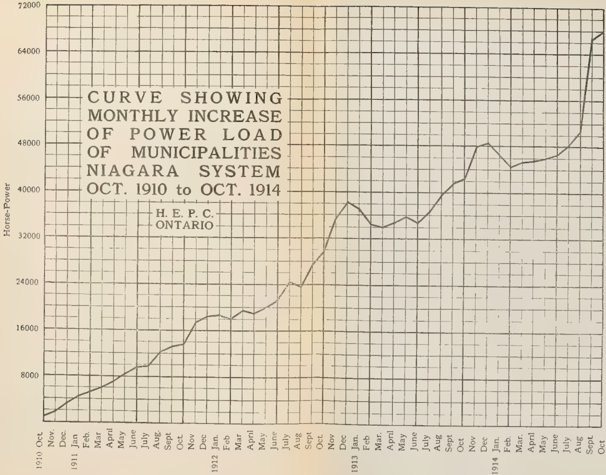
The floors of all the small distributing stations have been painted and the stations and the grounds about them cleaned up generally.

The Commission has also given considerable assistance to the various municipalities in overhauling their equipment, as in many cases such repairs are beyond the capacities of the municipal representatives, and it would be too expensive for them to maintain proper apparatus.

The improvement of the interior and surrounding grounds of the high-tension stations has been continued with a very pleasing effect. In the stations, enclosed offices have been erected to accommodate the operator's desk. These offices will effect a considerable saving in the coal required for the heating of the stations during the winter as they may be heated electrically with "off-peak" power thus obviating the necessity of heating the entire station to a comfortable temperature.

The roadways leading to high-tension stations were considerably improved in the spring. The old roadway leading to Dundas high-tension station immediately adjoining the Des Jardins Canal was considered entirely unsafe for the transportation of heavy electrical equipment and to provide a suitable approach to the station it was decided to build a new roadway. Accordingly a right-of-way 35 feet wide and 1,200 feet long was purchased a few feet north of the old roadway. After the necessary grading and preparation of the ground a wet macadam road was laid at a very reasonable cost. The construction of this roadway has filled a long felt want in addition to its improved appearance over the old road.

The following municipalities were supplied with power during the fiscal year. The tables given below as well as the accompanying curve, show the increases in the loads:


CURVE SHOWING MONTHLY INCREASE OF POWER LOAD OF MUNICIPALITIES NIAGARA SYSTEM OCT. 1910 to OCT. 1914
H. E. P. C. ONTARIO
Horse-Power
72000
64000
56000
48000
40000
32000
24000
16000
8000
1910 Oct
Nov.
Dec.
1911 Jan
Feb.
Mar
April
May
June
July
Aug.
Sept
Oct.
Nov
Dec
1912 Jan.
Feb
Mar
April
May
June
July
Aug
Sept
Oct
Nov
Dec
1913 Jan.
Feb
Mar.
April
May
June
July
Aug
Sept
Oct
Nov
Dec
1914 Jan.
Feb.
Mar.
April
May
June
July
Aug
Sept.
Oct

Municipality	Load in H.P. Oct. 1913	Load in H.P. Oct. 1914	Difference in H.P.	
			Increase	Decrease
Toronto	17997.5	21508.5	3511.	....
Hamilton	3639.5	6340.5	2701.	....
London	3385.	5047.	1662.	....
Guelph	1488.	1427.5	....	60.5
Berlin	1434.5	1816.5	382.	....
St. Thomas	1173.	1662.	489.	....
Galt	1025.5	1103.	77.5	....
Preston	931.5	804.	....	127.5
Woodstock	808.5	840.	31.5	....
Stratford	791.	837.5	46.5	....
Welland	536.	500.	....	36.
Brampton	474.5	493.	18.5	....
Ingersoll	469.	321.5	....	147.5
Waterloo	409.	453.	44.	....
St. Mary's	368.5	342.	....	26.5
Milton	321.5	143.5	....	178.
Dundas	268.	312.5	44.5	....
Hespeler	254.5	212.	....	42.5
Seaforth	214.5	225.	10.5	....
Tillsonburg	208.	205.	....	3.0
Mitchell	201.	111.	....	90.
Baden	165.	149.	....	16.
New Hamburg	153.	104.5	....	48.5
Weston	151.5	149.	....	2.5
Hagersville	120.5	76.	....	44.5
Norwich	104.5	84.5	....	20.
Beachville	100.5	131.5	31.	....
Georgetown	83.	119.5	36.5	....
Toronto Township	80.5	126.	45.5	....
Port Stanley	73.	66.	....	7.0
Mimico	71.	114.	43.	....
Acton	56.	69.5	13.5	....
Waterdown	41.5	72.5	31.	....
Port Credit	33.5	55.	21.5	....
Caledonia	32.	33.5	1.5	....
Rockwood	25.	29.5	4.5	....
Elmira	....	59.	59.	....
Streetsville	50.	50.	....	....
Cooksville	5.	31.	26.	....
Port Dalhousie	94.	119.	25.	....
Mimico Asylum	161.	231.3	70.3	....
Ontario Agricultural College	129.	142.5	13.5	....
London Asylum	120.	94.	....	26.
Hamilton Asylum	80.5	87.	7.5	....
Central Prison Farm (Guelph)	31.	47.	16.	....

A list of the municipalities connected to the Niagara System during the past year is given below:

Municipality	Date connected	Initial Load H.P.	Present Load H.P.	Increase H.P.
Goderich	Dec. 28, 1913	187.5	214.5	27.
Paris	Jan. 4, 1914	228.	222.5	....
Brantford	Jan. 17, 1914	134.	974.5	840.5
Thorndale	" 27, 1914	14.	13.	....
Thamesford	" 27, 1914	10.	37.	27.
New Toronto	" 30, 1914	10.	10.	....
Clinton	Feb. 15, 1914	67.	95.	28.
St. Catharines	Apr. 1, 1914	1045.	1019.	....
Terra Cotta	July 3, 1914	35.	45.5	10.5
Windsor	Aug. 20, 1914	590.	590.	....
Elora	Oct. 22, 1914	80.5	80.5	....
Fergus	" 22, 1914	53.5	53.5	....
Walkerville	" 28, 1914	33.5	33.5	....

The Capital Investment of the Niagara System in Operation at October 31st, 1914, is as follows:

Right-of-Way	$574,806 67
Steel Tower Transmission Lines	2,095,009 89
Telephone Lines	129,706 69
Relay System Lines	54,537 32
Conduit System, Ontario Power Company to Niagara Station	66,844 67
Wood Pole Lines	1,047,924 46
Transformer Stations	1,905,352 25
Distributing Stations	86,674 65
Total	$5,960,856 60

The Total Expenditures in connection with the Operation and Maintenance of the Niagara System for the Fiscal Year 1913-1914 are as follows:

Operators' Salaries and Expenses, including Operating Supplies	$53,008 35
Maintenance of Steel Towers and Telephone Lines	55,597 73
Maintenance of Low-Tension Lines	10,673 00
Maintenance of Transformer Stations	27,942 59
Maintenance of Distributing Stations	1,632 98
Administration and General Office Expenses	32,703 93
	$181,558 58
Interest at 4% per Annum on Invested Capital	204,943 81
Cost of Power at Niagara Falls	465,098 31
	$851,600 70

A summary of the Financial Statement of the Niagara System Operation for the Fiscal Year ending October 31st, 1914, is given below:

RECEIPTS

Power delivered, including charges for administration, general expenses, operation, maintenance and interest	$994,253 98

DISBURSEMENTS

Power purchased, including losses in transmission and transformation, administration, general expenses, maintenance and interest	851,600 70
Surplus	$142,653 28

Third Annual Adjustment of Capital Expenditures, Operating Expenses and Fixed Charges of Niagara System

FISCAL YEAR, 1913-1914

Municipalities.	Rate	Yearly average H.P.	Capital Cost	Interest	Maintenance	Operation	Total Interest Maintenance and Operation	Cost of Power including losses	*Total Expenditure	Receipts	Surplus Applicable to Depreciation Reserve Ac.	Shortage on Interest Account	Surplus Applicable to Depreciation Reserve Ac.
	$		$	$	$	$	$	$	$	$	$	$	$
Toronto	15.00	20597.	1,248,301.74	46,812.36	24,027.61	13,437.28	84,277.25	188,752.56	273,029.81	308,955.61	35,925.80	....	....
Port Credit.	28.00	72.8	10,279.99	391.04	189.35	211.64	792.03	666.93	1,458.96	2,022.27	563.31	....	....
Weston	30·00	275.1	66,610.56	2,585.85	1,367.83	674.04	4,627.72	2,521.48	7,149.20	8,617.01	1,467.81	....	....
Brampton	25.00	722.2	96,998.18	3,705.57	1,966.88	1,639.16	7,311.61	6,618.53	13,930.14	19,071.13	5,140.99	....	....
Milton	28.00	465.9	87,947.87	3,406.30	1,430.64	1,022.95	5,859.89	4,270.11	10,130.00	12,948.65	2,818.65	....	....
Mimico	28.00	154.5	24,943.70	949.56	529.36	423.09	1,902.01	1,415.92	3,317.93	4,334.93	1,017.00	....	....
New Toronto.	28.00	12.2	1,971.30	75.04	41.83	45.07	161.94	111.91	273.85	339.32	65.47	....	....
Streetsville	34.00	199.9	29,956.88	1,100.34	761.11	411.62	2,273.07	1,830.70	4,103.77	6,435.55	2,331.78	....	....
Toronto Tp.	25.00	140.5	20,074.61	769.18	359.29	495.53	1,624.00	1,287 61	2,911.61	3,645.23	733.62	....	....
Dundas	15.00	535.9	32,815.84	1,184.60	545.47	619.09	2,349.16	4,910.76	7,259.92	8,562.26	1,302.34	....	....
Hamilton	15.00	5676.1	363,770.26	13,191.50	6,370.25	6,080.07	25,641.82	52,016.17	77,657.99	95,134.79	17,476.80	....	....
Waterdown	26.00	80.2	13,462.06	519.29	257.16	195.07	971.52	734.64	1,706.16	2,100.47	394.31	....	....
Caledonia	24.00	30.8	3,940.38	149.97	56.93	103.59	310.49	282.14	592.63	755.54	162.91	....	....
Hagersville	33.21	109.7	30,244.88	1,180.08	444.89	263.80	1,888.77	1,006.13	2,894.90	3,562.42	667.52	....	....
Guelph	21.00	1608.	181,020.26	6,826.37	4,536.96	3,959.13	15,322.46	14,736.00	30,058.46	34,879.53	4,821.07	....	....
Acton	36.00	71.6	22,362.95	873.87	546.58	217.54	1,637.99	656.02	2,294.01	2,517.85	223.84	....	....
Rockwood	38.00	32.1	13,424.33	515.13	348.97	130.19	994.29	294.40	1,288.69	1,188.67	....	100.02	....
Georgetown	36.00	116.3	57,296.91	2,247.35	1,540.46	449.78	4,237.59	1,065.54	5,303.13	4,003.66	....	1,299.47	....
Preston	21.00	1293.1	151,896.63	5,604.44	3,126.56	1,691.03	10,422.03	11,849.86	22,271.89	27,286.23	5,014.34	....	....
Galt	21.50	1430.8	165,569.14	6,241.35	3,415.12	2,236.97	11,893.44	13,111.66	25,005.10	30,715.36	5,710.26	....	....
Hespeler	23.00	305.4	36,541.57	1,380.23	786.30	470.47	2,637.00	2,799.25	5,436.25	6,885.96	1,449.71	....	....
Berlin	21.50	1741.9	204,880.92	7,717.85	5,887.68	3,137.51	16,743.04	15,962.91	32,705.95	37,452.08	4,746.13	....	....
Waterloo	22.50	444.4	56,556.84	2,140.48	1,607.01	821.27	4,568.76	4,072.52	8,641.28	10,045.16	1,403.88	....	....
New Hamburg.	32.00	146.5	37,427.21	1,456.57	1,173.16	401.68	3,031.41	1,342.54	4,373.95	5,118.26	744.31	....	....
Baden	32.00	145.2	31,456.51	1,230.29	953.18	380.63	2,564.10	1,330.62	3,894.72	4,645.31	750.59	....	....
Elmira	38.00	74.1	35,665. 46	1,264.25	528.92	178.13	1,971.30	679.06	2,650.36	2,844.81	194.45	....	....
Stratford.	30.00	826.6	150,627.63	5,766.64	4,948.33	2,430.18	13,145.15	7,575.03	20,720.18	25,427.45	4,707.27	....	....
Seaforth	40.00	206.3	74,223.25	2,904.41	1,742.45	576.27	5,223.13	1,890.55	7,113.68	8,542.84	1,429.16	....	....
Mitchell	37.00	145.5	40,969.32	1,593.28	1,307.39	405.33	3,306.00	1,333.37	4,639.37	5,383.42	744.05	....	....
Clinton	39.00	50.6	33,427.12	1,045.40	430.31	204.16	1,679.87	463.70	2,143.57	1,972.70	....	170.87	....
Goderich	37.00	143.	125,532.71	3,853.90	1,091.74	665.57	5,611.21	1,310.46	6,921.67	5,711.90	....	1,209.77	....

St. Mary's	29.50	1821.3	378,790.88	14,466.03	8,923.18	3,997.51	27,386.72	16,690.54	44,077.26	54,467.54	10,390.28	....	....
Woodstock	23.00	817.6	120,208.09	4,258.30	2,654.16	2,013.15	8,925.61	7,492.26	16,417.87	19,247.61	2,829.74	....	....
Ingersoll	25.50	438.3	87,466.37	3,200.59	1,836.87	1,174.25	6,211.71	4,017.13	10,228.84	11,613.24	1,384.40	....	....
Tillsonburg ...	32.00	218.	76,070.17	2,861.89	1,693.17	569.99	5,125.05	1,997.45	7,122.50	7,062.07	....	60.43	....
Norwich..... ..	32.00	92.4	32,627.87	1,233.33	861.76	245.16	2,340.25	846.79	3,187.04	2,951.63	....	235.41	....
Beachville	31.00	102.3	23,256.82	853.75	560.40	331.10	1,745.25	937.56	2,682.81	3,165.28	482.47	....	....
London.......	23.00	4203.9	708,460.39	23,269.54	13,886.66	6,405.73	43,561.93	38,525.41	82,087.34	97,421.80	15,334.46	....	....
Thamesford ..	45.00	20.3	19,335.62	520.65	282.63	77.80	881.08	185.92	1,067.00	907.45	....	159.55	....
Thorndale	45.00	10.6	16,289.94	434.75	162.97	57.25	654.97	96.71	751.68	469.37	....	282.31	....
St. Thomas...	28.00	1807.6	471,869.45	15,850.43	7,750.07	4,184.63	27,785.13	16.564.70	44,349.83	50,007.81	5,657.98	....	....
Port Stanley {	9. + 243.67	119.4	55,004.26	1,998.18	1,525.62	275.11	3,798.91	1,094.49	4,893.40	4,545.58	....	347.82	....
Brantford	19.50	582.2	139,269.00	4,298.33	1,520.02	2,298.20	8,116.55	5,335.33	13,451.88	11,387.65	....	2,064.23	....
Paris	21.00	158.	43,040.64	1,323.02	432.76	910.22	2,666.00	1,447.92	4,113.92	3,573.32	....	540.60	....
Niagara Dist.	14.00	2506.2	338,970.09	1,692.53	276.90	353.75	2,323.18	22,967.02	25,290.20	36,327.26	11,037.06	....	....
Totals....	......	50,752.3	5,960,856.60	204,943.81	114,686.89	66,871.69	385,502.39	465,098.31	851,600.70	994,253.98	149,123.76	6,470.48	142,653.28

* Total Expenses including losses in transmission and transformation, administration and Cost of Power, General Expenses, Operation, Maintenance and Interest.

PORT ARTHUR SYSTEM

The increase in the load of the Port Arthur System has been very satisfactory during the past year and the outlook for the coming year is very promising. The percentage of interruptions has been very small and no failure of apparatus in the substation has occurred.

The new extension of the high-tension station has been completed, and the additional switchboards and apparatus have been installed. This equipment appreciably increases the efficiency of the operation of this system.

The new 22,000-volt line from the substation to the new Government grain elevator also supplies two other important loads, viz., the Canadian Northern Elevator Co., and the Davidson & Smith Elevator Co. These municipal loads show every indication of a considerable increase during the next year.

During the past year there has been a new 22,000-volt line built from the substation to supply the new waterworks station of the City of Port Arthur. As this station is entirely electrically operated and is situated at a distance from the city, it is evident that a considerable amount of power will be required when it is placed in operation.

With the growth of the system in and around Port Arthur, the power demand of the municipality, exclusive of the municipal plant at Current River, should be considerably increased in the near future.

The Capital Investment for the Port Arthur System to October 31st, 1914, is as follows:

Transmission Lines	$18,991 08
Transformer Station and Extensions	84,739 79
Total	$103,730 87

The Operating and Maintenance Expenses for the Fiscal Year ending October 31st, 1914, are as follows:

Operators' Salaries and Expenses, including Operating Supplies and proportion of Administration and General Office Expenses	$5,114 34
Interest at 4%	4,000 90
Sinking Fund at 1.8%	1,814 10
Cost of Power	37,778 90
Total	$48,708 24

A Financial Statement of Operation for the Fiscal Year ending October 31st, is as follows:

Revenue, including Charges for Administration, General Expense, Operation, Interest, Sinking Fund, and Depreciation	28,442 h.p.	$52,683 66
Expenses, including Cost of Power, Administration, General Expense, Operation, Interest, and Sinking Fund	28,442 h.p.	48,708 24
Surplus applicable to Depreciation Fund		$3,975 42

SEVERN SYSTEM

During the early part of the past year, arrangements were made by the Commission to purchase the property of the Simcoe Railway and Power Co., of Midland, so that the whole of the Severn System would be under the management and control of the Commission, thereby permitting of a more complete supervision and operation for the benefit of the municipalities supplied off this system.

The property of the Company, consisting of the dams and buildings and plant at the Big Chute on the Severn River, two pole lines between the Big Chute and Waubaushene 12 miles in length, the single pole line between Waubaushene and Midland, 15 miles in length, the Victoria Harbor tap line 1½ mile in length, and the substations and properties at Midland and Victoria Harbour were placed under the supervision of the Operating Department of the Commission on July 1st, 1914.

Up until the time of the transfer, the operation of the plant and lines had been handled jointly by the Power Company and the Commission. Since July 1st, the system has been operated jointly by the System Operator at Waubaushene in charge of the lines and substations, and the Power House Superintendent in charge of the operation of the plant and equipment at the Big Chute.

During the year, the lines of the Severn system have been equipped with tap and sectionalizing switches, so as to improve the operation of the line and also to cut down the maintenance cost and inconveniences to different sections in case of trouble on the system.

Severn System supplies power to the following municipalities in the County of Simcoe:

Midland.	Stayner.
Penetang.	Elmvale.
Barrie.	Coldwater and
Collingwood.	Creemore.

The municipality of Creemore was first supplied with power on the 21st of October, 1914, from the Stayner distribution station. This supply is three-phase, 4,000-volt power. The Creemore load has shown a favorable increase to the end of the fiscal year.

The Commission also has a contract with the town of Orillia to supply the municipality with power when it is required to help out their own plant, which is situated at the Ragged Rapids, some ten miles farther up the river than the Commission's plant at the Big Chute.

The maximum load of this system during the fiscal year, 1914, not counting the load of the municipality of Orillia, was 1,368 h.p.

The operation of the System along the lines mentioned above, has proved to be very satisfactory.

The operating Capital Investment for the Severn System to October 31, 1914, is as follows:

Power Development	$434,177 64
(Purchase of Simcoe Ry. Co.'s Plant and System)	
Transmission Lines	206,178 05
Distributing Stations	37,497 69
	$677,853 38

The following is a statement of the Operating and Maintenance Expenses of the Severn System for Fiscal year ending October 31, 1914, together with the Revenue derived from same:

RECEIPTS

Midland—Power Account	$6,469 45	
Penetang—Power Account	7,534 82	
Collingwood—Power Account	10,280 14	
Barrie—Power Account	10,417 50	
Coldwater—Power Account	871 46	
Elmvale—Power Account	1,398 87	
Stayner—Power Account	2,672 63	
Orillia—Power Account	1,600 00	
Victoria Harbor and Midland—Miscellaneous Collections	915 23	
		$42,160 10

EXPENDITURES

Operators and patrolmen's salaries and expenses, and proportion of administration and General Office Expenses	$9,490 83	
Interest at 4% on Capital Expenditures	9,659 11	
Interest at 4% on Capital Expenditures (S. R. & P. Co. plant)	5,502 02	
Power purchased to June 30, 1914	15,191 92	
		39,843 88
Surplus applicable to Depreciation Reserve		$2,316 22

WASDELL'S FALLS SYSTEM

The Wasdell's Falls System, owned and operated by the Hydro-Electric Power Commission, was placed in operation on October 6th, 1914.

The power for this system is generated at Wasdell's Falls station at 2,300 volts, three-phase, 60 cycle; transformed to 23,000 volts and transmitted for distribution to the Beaverton and Cannington high-tension receiving station. The municipality of Beaverton is supplied from the Beaverton high-tension station. This station was also designed to serve the municipalities of Brechin and Gamebridge, which are situated north of Beaverton.

The municipalities of Cannington, Woodville and Sunderland and the adjacent farming districts are supplied from the Cannington high-tension station. The high-tension receiving station feeders are three-phase, 4,000-volt feeders.

Beaverton and Cannington first received power on October 6th, Woodville on October 19th, and Sunderland on October 16th.

The operation of this system is carried out by having the men in charge of the Cannington and Beaverton districts co-operate with each other, and the operators at the Power House.

The lines are inspected and maintained by the men in charge of the districts, and in case of trouble the power house operators co-operate with the district men in locating and clearing the lines of trouble.

The operation of the plant and system to date has been very satisfactory, and all indications point to the rapid growth of the power load in this section.

OTTAWA SYSTEM

The Ottawa System as operated by the Commission, at present supplies only the City of Ottawa. Three-phase power is supplied to the Ottawa Municipal Electric Department at 11,000 volts, 60 cycles through two three-conductor, lead sheathed, underground 11,000-foot cables from the generating station of the Ottawa and Hull Power Company located in Hull, Quebec. Owing to the fact that the power is transmitted underground and the distance comparatively short, there has been no interruptions in the service.

To date the load taken by the City of Ottawa has shown a favorable increase each month.

ST. LAWRENCE SYSTEM

Three municipalities, namely, Prescott, Winchester and Chesterville are at present supplied with power from the Eastern System of the Commission.

The power is purchased from the Rapids Power Company at their step-up station near the canal bank opposite their plant at Morrisburg and is delivered to the Commission at 26,400 volts, three-phase, 60-cycle. From this point it is transmitted 23 miles west to Prescott, Ontario, and 18 miles north to Winchester, Ontario. Power is supplied Prescott directly from the high-tension lines, and is transformed in the Prescott distribution station to 2,300 volts, three-phase, for local distribution. Power is also supplied to the Winchester distribution station from the high-tension line, and is transformed to 4,000 volts, three-phase, for the municipalities of Winchester and Chesterville, Chesterville being supplied over a seven mile line which runs in an easterly direction from Winchester distribution station.

The lines and stations on this system are operated and maintained efficiently by the co-operation of the superintendent of the local commission at Prescott, the superintendent of the northern section located at Winchester and the operators of the Rapids Power Company at Morrisburg generating station. This co-operative method of operating the system has proven very satisfactory to the municipalities to date.

Line sectionalizing switches have been manufactured and are to be installed in the near future on this system, so that the operation may be more efficient, the maintenance cost lower, and trouble when it occurs on the system easily located and quickly remedied with as little inconvenience as possible to the Municipalities supplied.

The municipality of Winchester has been receiving power since December 18th, and the municipality of Chesterville since the 7th of February, of this fiscal year. All municipalities supplied are showing favorable results to date.

The operating Capital Investment of the St. Lawrence System to October 31st, 1914, is as follows:

Transmission Lines	$105,790 72
Distributing Stations	9,726 58
	$115,517 30

The following is a statement of the Operating and Maintenance Expenses of the St. Lawrence System for the Fiscal Year ending October 31st, 1914, together with the Revenue derived from same.

Expenditures		
Cost of Power	$2,712 40	
Maintenance and Operation	824 21	
Interest	3,887 97	
		$7,424 58
Receipts		
Prescott	$4,788 23	
Winchester	1,704 27	
Chesterville	1,031 87	
		7,524 37
Surplus		$99 79

TOTAL CAPITAL COST TO OCTOBER 31st, 1914

Following is a statement of expenditures on Capital Account, including Niagara, Severn, Wasdell's, St. Lawrence, Eugenia, Port Arthur, and Renfrew Systems, also Municipal Construction (Chargeable), Stock on hand and Tools.

Niagara System

Transmission Lines (Operating)		
Right-of-Way	$574,806 67	
Steel Tower Lines	2,095,050 23	
Telephone Lines	129,706 69	
Relay System Lines	54,537 32	
Conduit Systems (Ontario Power Co. to Niagara Station)	66,844 67	
		$2,920,945 58
Windsor Extension (Not Operating)		
Right-of-Way	$195,060 87	
Steel Tower and Telephone Lines	835,734 97	
		1,030,795 84
Duplication of Transmission Line, Niagara to Dundas (Not Operating)		
Right-of-Way	$47,264 25	
Steel Tower and Telephone Lines	258,305 92	
		305,570 17
Wood Pole Lines in Operation	$1,047,924 46	
Wood Pole Lines in course of Construction	191,572 20	
		1,239,496 66
Welland and St. Catharines District Lines		8,239 20
Rural Line Construction		159,382 23
Transformer Stations		
Stations in operation	$1,905,352 25	
Stations and Extensions in course of Construction	342,080 83	
		2,247,433 08
Distributing Stations in Operation	$86,674 65	
Distributing Stations in course of Construction	5,138 18	
		$91,812 83

Other Systems

Port Arthur Capital Cost		
Transmission Line	$18,991 08	
Transformer Station	84,739 79	
		103,730 87
Penetang Capital Cost		
Transmission Line	$9,149 19	
Transformer Station	7,091 82	
		16,241 01
St. Lawrence System		
Transmission Lines in Operation	$105,790 72	
Transmission Lines in course of Construction	8,274 86	
Distributing Stations in Operation	9,723 49	
Distributing Stations in course of Construction	38 51	
Preliminary Survey on Steel Tower Lines	373 98	
		124,201 56
Severn System		
Power Development (Purchase of Simcoe Railway & Power Co.'s Plant and System.)	$434,177 64	
Transmission Lines in Operation	197,028 86	
Transmission Lines in course of Construction	11,884 19	
Distributing Stations in Operation	30,405 87	
Distributing Stations in course of Construction	2,454 81	
		675,951 37

Wasdell's Falls System		
Power Development Plant and Transformer Station ..	$112,832 26	
Transmission Lines	94,051 24	
Distributing Stations	3,444 42	
		210,327 92
Eugenia Falls System		
Right-of-Way and Power Development Plant	$228,556 30	
Transmission Lines	10,102 71	
Transformer Stations	49 84	
Distributing Stations	30 68	
		238,739 53
Renfrew System		
Round Lake Storage Dam	$20,763 74	
		20,763 74

General

General Accounts (Chargeable)		
Construction Work Charged to Municipalities..........	$308,748 62	
Sales to Municipalities	25,003 12	
St. Lawrence District Operating Charges	829 70	
Ottawa Power and Operating Charges	5,820 05	
London and Port Stanley Railway Construction	7,725 49	
Cable Reels (returnable)	3,146 07	
		351,273 05
General Accounts (Capitalized)		
Office Furniture and Equipment	$11,576 41	
Unexpired Insurance, Employees	2,473 18	
Unexpired Insurance, Office Equipment	88 70	
Stationery on Hand	1,327 99	
Cameras	333 87	
Travellers' Certificates	359 25	
		16,159 40
Garage Account		
Automobiles (less depreciation)	$21,516 06	
Stock on Hand (Covers, Tubes, etc.) and Repairs......	11,182 11	
Unexpired Automobile Insurance	1,724 25	
		34,422 42
Machine Shop Account		
Labour and Material on Unfinished Products Chargeable to Construction on Completion	$1,178 41	
		1,178 41
Storehouse, etc.		
Toronto Storehouse, Testing Laboratory, Garage and Machine Shop	$74,633 83	
Dundas Storehouse	1,586 04	
		76,219 87
Office Building	$69,493 08	
		69,493 08
Stock and Tools		
Line and Station Construction Stock on Hand	$152,626 01	
Line Maintenance Stock	17,631 43	
Station Maintenance Stock	11,529 15	
		181,786 59
Line and Station Construction Tools (less depreciation)	$2,946 31	
Line and Station Maintenance Tools (less depreciation)	1,802 20	
Camp Equipment (less depreciation)	1,135 91	
		5,884 42
Total Expenditure		$10,130,048 83

PROVINCIAL EXPENDITURES

Provincial Account for Fiscal Year, 1913-4

Engineering assistance to the non-operating Municipalities; the gathering of data throughout the Province for statistical purposes; reports on Municipal operation, and also the making of estimates for the delivery of power for Municipalities arranging to take current	$28,898 41
Municipal estimates for power supply and rate investigation	4,851 29
Hydrographic surveys, storage surveys for the Province, reports and investigations of power sites and reports on stream flow	25,921 13
Reports on overhead and underground construction for Municipalities, rural districts, and auxiliary plant investigations	6,025 58
Engineering investigations for Municipalities, testing, and reports on proposed Municipal Electric Railways	32,570 66
Rules and Regulations, inspection of installation of systems for the utilization of electric energy	6,416 87
Engineering in connection with collection of data on Municipal Illumination, and standardization of meters, motors and transformers	3,510 16
Demonstration at Rural and Urban Fairs	6,830 72
Niagara Surveys	6,354 06
Grand River Storage Surveys	6,183 24
Grand River Hydrographic Surveys	6,623 78
Lake of the Woods—District Surveys, Hydrographic and Stream Flow	4,394 07
General Office Expenses, including Secretary's Accounting, Stenographical and General Office Staffs, also stationery and rent	27,422 86
Administration	16,440 47
Total	$182,443 30

BALANCE SHEET

Assets

Sundry Expenditures, per list	$10,130,048 83
Warrantable advances	23,116 42
Power Bills unpaid, October 31st, 1914	168,044 37
Cash on hand	52,684 13
	$10,373,893 75

Liabilities

Provincial Treasurer	$10,010,202 92
Niagara System, Surplus applicable to Depreciation Reserve Account	333,625 60
Severn System, Surplus applicable to Depreciation Reserve Account	2,456 02
Port Arthur System, Surplus applicable to Depreciation Reserve Account	17,727 41
Welland System, Surplus applicable to Depreciation Reserve Account	700 55
Interest Account	8,970 12
Storehouse and Laboratory Operation Surplus	211 13
	$10,373,893 75

EXPENDITURES DURING FISCAL YEAR ENDING OCTOBER, 1914

Niagara System

Right-of-Way	$10,461 47	
Steel Tower Transmission Lines	311,264 10	
Telephone Lines	25 00	
Conduit System, Ontario Power Co. to Niagara Station	18,919 75	
		$340,670 32

WINDSOR EXTENSION

Right-of-Way	$153,482 83	
Steel Tower and Telephone Lines	724,043 01	
		877,525 84

NIAGARA-DUNDAS DUPLICATION

Right-of-Way	$ 47,264 25	
Steel Tower and Telephone Lines	258,305 92	
		305,570 17
Wood Pole Lines	$471,582 18	
Rural Line Construction	123,499 52	
Welland and St. Catharines District Lines	172 87	
		595,254 57
Transformer Stations and Extensions	$675,649 04	
Distributing Stations	18,146 67	
		693,795 71
		2,812,816 61

Severn System

Power Development	$434,177 64	
Transmission Lines	14,739 96	
Distributing Stations	7,906,53	
		456,824 13

Wasdell's Falls System

Power Development Plant	$ 98,418 22	
Transmission Lines	93,734 05	
Distributing Stations	3,444 42	
		195,596 69

St. Lawrence System

Transmission Lines	$ 24,403 39	
Distributing Stations	6,850 91	
		31,254 30

Eugenia Falls System

Power Development Plant and Right-of-Way	$228,556 30	
Transmission Lines	10,102 71	
Transformer Stations	49 84	
Distributing Stations	30 68	
		238,739 53
Port Arthur Capital Cost	$ 13,305 61	
Round Lake Storage Dam	3,001 86	
Storehouse and Laboratory	24,316 26	
Office Building	69,493 08	
		110,116 81

General Accounts

Municipal Construction (Chargeable)	$185,863 20	
Sales to Muicipalities	25,003 12	
Railway Construction	7,725 49	
Cable Reels	3,146 07	
Automobiles, Office Equipment, etc.	28,597 67	
Construction and Maintenance Stock	109,541 05	
Tools and Camp Equipment	3,168 56	
		363,045 16
Provincial Accounts		182,443 30
		$4,390,836 53

SECTION IV

MUNICIPAL WORK

MUNICIPAL ADVICES

Preliminary Work

Investigations were made of the existing power conditions in municipalities, and their requirements, for use in preparing estimates of the cost of supplying power to them. Instructions were given as to the procedure to be followed to obtain electric power through the Commission. Wherever it was decided to submit the enabling by-law or a debenture by-law to cover the cost of a municipal distributing system, assistance was rendered, in preparing estimates of cost, and in placing the Hydro-Electric proposition before the ratepayers.

In addition to giving preliminary instructions to township municipalities as to the circulation of petitions, a number of them were assisted in obtaining applications for rural power service, at rates that had been recommended, based on estimates of the cost of serving petitioners.

During the year, work of this nature was taken care of by the Department in the following municipalities:

Ailsa Craig, Albion Township, Alexandria, Alliston, Amherstburg, Ancaster, Ancaster Township, Arkona, Ayr.

Barton Township, Beamsville, Beeton, Belwood, Beverly Township, Blenheim, Blenheim Township, Bolton, Bracebridge, Bradford, Brantford Township, Bruce Mines, Burford Township, Burlington.

Caledon Township, Carleton Place, Chapleau, Chatsworth, Chesley, Chinguacousy Township, Chippewa, Claremont, Clinton Township, Copetown, Conestogo, Creemore.

Delaware, Dorchester North Township, Dresden, Dumfries North Township, Durham, Durham Township, Dutton.

Embro, Embrun, Esquesing Township, Essex, Etobicoke Township.

Finch, Flamboro East Township, Flamboro West Township, Flesherton, Flos Township, Ford City.

Granton.

Hanover, Harriston, Harrow, Havelock, Highgate, Holland Landing, Huntsville.

Iroquois.

Kemptville, Kenmore, King Township, Kingsville.

Lambeth, Lakefield, Leamington, Louth Township, Lucan, Lynden.

Mountain Township, Markdale, Matilda Township, Morrison Township, Mount Brydges, Mount Forest.

Niagara Falls, Niagara Township, Nichol Township, Nissouri West Township, Norwich North Township, Norwood.

Oakland Township, Orangeville, Oxford East Township, Oxford West Township.

Peel County, Plummer additional Township, Port Colborne, Port McNicoll, Priceville, Prince Township, Puslinch Township.

Ridgetown, Rodney, Russell.

Sandwich, Shallow Lake, Shelburne, Simcoe, Smith's Falls, Southwold Township, St. Clements, St. Jacobs, Strathroy, Streetsville.

Tarentorus Township, Tavistock, Tay Township, Thessalon, Thorold Township, Tilbury East Township, Tiny Township, Toronto Gore Township, Tottenham, Trafalgar Township.

Vankleek Hill, Vaughan Township.

Walkerton, Wallaceburg, Waterford, Waterloo Township, Waubaushene, Wellesley, West Lorne, Williamsburg, Wilmot Township, Winchester Springs, Woodbridge.

Zorra Township.

Estimates have been submitted to a number of the foregoing municipalities, some of which have taken definite steps towards entering into agreements with the Commission for a supply. Further notes on such municipalities are given in the reports following.

Acton

The Department has continued to act in a consulting and advisory capacity for this Municipality, and has in addition to supervising the general management of the utility, rendered engineering assistance in laying out extensions to the system and in the electrical installations of new power consumers.

Operating conditions in Acton have been very satisfactory, both financially and as to the distribution of their load. The amount of power taken from the Commission has increased from 56 h.p. taken during October, 1913, to 141 h.p.

Algoma District

After investigating the power requirements of Thessalon, Bruce Mines and the Townships of Tarentorus and Plummer additional, it was not deemed feasible to undertake the development and transmission of Hydro-Electric power at this time.

Ancaster Village

By a resolution of the Ancaster Police Village Board, the Commission was requested to enter into negotiations for the Town of Dundas to give the village power and lighting service.

This arrangement was made during the latter end of December and orders were immediately placed for materials. Construction work was carried on by the Dundas Commission under the supervision of this Department, the installation being completed and service commenced early in May, using rates as recommended by the Commission.

(See report on Dundas.)

The following estimated costs of power to Ayr, together with other municipalities in this district, were submitted:

Ayr, 100 h.p.	$37.40 per h.p. per year.
Drumbo, 25 h.p.	$40.73 per h.p. per year.
Plattsville, 100 h.p.	$49.27 per h.p. per year.
Princeton, 25 h.p.	$65.95 per h.p. per year.
Wolverton, 40 h.p.	$43.17 per h.p. per year.

A form of agreement covering the delivery of 100 h.p. to Ayr at the estimated cost noted above, was drawn up and forwarded to the village officials. This was signed towards the latter part of April.

Previously Ayr had been operating a municipally owned steam-driven electric generating and distributing system. As soon as its agreement had been signed, plans were prepared for remodelling the system, and orders placed for the necessary materials. The reconstruction work in Ayr has been carried on under the supervision of this of this Department.

Recommendations have been made as to the schedule of rates to be used in Ayr in billing power and lighting consumers.

Baden

The operation of the Baden distribution system has continued very satisfactory during the year, and there are prospects of further increases in business in the near future. The load has increased during the year from 153 h.p. taken during October, 1913, to 187.5 h.p. for the last current month. Assistance has been rendered the local officials in connection with the management of their utility. and with laying out extensions to serve new power consumers.

Street lights have been added to the extension serving St. Agatha and Petersburg, which is managed and operated by Baden. A number of rural services have also been connected to this extension using rates as recommended by the Commission.

Barrie

There has been a steady increase in the load taken by the municipality, having grown from 288 h.p. for October, 1913, to 415 h.p. for the last current month.

In the preceding report, reference was made to a proposal to instal electrically driven waterworks pumps. A study was made of the various tenders received, and recommendations were submitted together with plans of a proposed layout.

Beachville

Conditions in Beachville have continued very favorable, the utility being on a firm basis financially. There has been no marked increase in the load of the Municipality, but the power taken has been so distributed among the consumers as to give a very good load factor, resulting in a large increase in earnings and warranting a substantial reduction in rates.

Beaverton

The reconstruction of the Beaverton distribution and street lighting systems was carried on under the supervision of this Department, and everything was complete and in operating condition prior to the delivery of power from the Wasdell's Falls development. Power was first delivered to Beaverton on October 6th, the occasion being marked by a formal opening and public demonstration.

A schedule of rates was recommended for use in billing power and lighting consumers, and the local officials were instructed in their application. Assistance is being given in an endeavor to work up a substantial power load, both in Beaverton and in the other municipalities in that district who are now receiving their power from the Commission.

Belleville

In compliance with a request from the City of Belleville, an investigation was made of the conditions in the water works pumping plant. A complete report was prepared on its operation and recommendations were made as to the handling of contemplated additional installations. Suggestions were also given respecting the operation of the present equipment. This report was submitted to the Municipality.

The franchise for street lighting being about to expire, the Commission was requested to advise the Corporation regarding the granting of a new franchise to the local distributing company. Assistance was also required in laying out proposed changes in the street lighting system and in installing an underground system in down town districts. The proposed new agreement was submitted to the Commission for comment. This was re-drafted to embody the conditions recommended, and submitted to the municipality.

The Corporation adopted all of the Commission's recommendations.

Belwood

The following estimated costs of power were submitted to the Village of Belwood:

50 h.p.	$50.00 per h.p. per year.
75 h.p.	$45.00 per h.p. per year.

Schedule of rates based on the above were also prepared and submitted.

Berlin

The operation of the Berlin distribution system has been very satisfactory, the growth of revenues over expenses being such as to warrant a substantial reduction in rates. The load taken from the Commission has shown a substantial increase, the maximum of 1,468 h.p. taken during 1913 having grown to 1,843 h.p. for the present year.

In addition to advising the municipal officials on minor details of management and operation, general plans for increasing the capacity of the municipal substation were submitted to the local officials, who approved of the same and instructed the Commission to prepare detailed drawings covering the work.

Bolton

The village of Bolton was advised that 250 h.p. could be delivered at the estimated cost of $43.61 per h.p. per year. This rate was for power at a voltage suitable for distribution within the village limits. It was also advised that $10,300 would be required to acquire the local distribution system, and to remodel it.

The enabling by-law and a by-law to authorize an issue of debentures for $9,500 were carried by the ratepayers on August 3rd.

Brampton

Assistance has been given Brampton in simplifying the method of handling a number of details in connection with the management of the utility.

There has been no marked increase in the load during the year, but that taken has been so distributed among the various users as to give a greatly increased use without increasing the demand. This has resulted in a substantial increase in revenues without increasing expenses materially.

Applications were received for rural power in Chinguacousy Township near the limits of the Town of Brampton. It is proposed to have the town extend its system to take care of these applicants and negotiations to this end are now in hand.

Brantford

Portions of Brantford's Municipal distributing system were completed on January 14th and power first supplied on that date. Since then this work has been continued together with the connecting of services to consumers. The local department has been very successful in working up a power and lighting business. the loal taken from the Commission having so far grown to 972 h.p.

Assistance has been given the local department in the various details in connection with the management and operation of the utility, and also in obtaining power consumers.

The City of Brantford having taken over the lines and equipment of the Grand Valley Railway, and the contract for its power being about to expire, negotiations were entered into to obtain this load for the local Hydro-Electric department. A study was made of the load conditions of the railway, and of the cost of giving the required service. It was apparent that it would be advantageous to shut down a steam plant supplying power to this road near Paris, and to purchase power from Paris at this point. An agreement has been drawn up and submitted, covering the delivery of this power. There is every possibility of this railway also taking power from Brantford on the expiration of the present agreement.

Arrangements have been made for Brantford to extend its distribution system to serve certain districts in Brantford Township, from which petitions were received. These extensions will be built as soon as the system within the City has been completed.

Brantford Township

In addition to those portions of this township that will be served by the City of Brantford, contracts have been obtained for rural service close to the Commission's Brant transformer station. An extension has been built in this district, and service is now being given.

Brechin

Plans covering the construction of the Brechin Municipal System were prepared and instructions issued covering its installation.

Breslau

In addition to the contract that has been obtained to supply a Brick Company at Breslau, another was signed for the supply of power to 60 h.p. of motors in a furniture factory. The demand on the Breslau station has reached 96 h.p. The proposition of giving domestic and street lighting service is now being taken up.

Brockville

Assistance was rendered the Light and Power Department on a number of questions in connection with the utility; some of the more important of these being outlined below.

The Brockville Hospital for Insane was considering making a complete electrical installation, to be supplied with power from the town. Advice was given to the town as to the handling of this business and providing service.

A report was requested on the advisability of reducing the rates for street lighting. A study was made of the installation and estimates were prepared of the cost of giving the service. As a result of this investigation the Municipality was advised that the desired reduction could be safely made.

In view of the construction of a transmission line to Brockville and erection of a substation in the near future, a representative visited the town to report on a possible station site and also on the equipment that would be required by the town. The load conditions of the present plant were investigated and inquiries made regarding the possibility of increase. The routes likely to be followed by the Commission in bringing lines into the corporation were also studied. With these details as well as the location of the load to be carried, a report was prepared and submitted.

Brockville Hospital for Insane

The Department of the Provincial Secretary requested an estimate of the cost of installing a distribution system and electric equipment in the Brockville Hospital for Insane. A representative visited the institution and made a study of its requirements. A detailed report was then prepared and submitted.

Burford Township

Instructions have been issued to the Construction Department covering the construction of lines for the rural distribution of power in this township. After these lines are completed they will be handed over to the village of Norwich for operation.

(See report on Norwich.)

Burlington

Estimated costs, as follows, were forwarded to the Municipality, the rates being for 2,200 volt power:

150 h.p.	$25.51 per h.p. per year.
300 h.p.	$21.66 per h.p. per year.
600 h.p.	$20.00 per h.p. per year.
800 h.p.	$19.08 per h.p. per year.

Caledon Township

A request was received for prices on 150 and 200 h.p. to be delivered to a manufacturer at Credit Forks in this township. Estimates were prepared and the following rates submitted for 2,200 volt power:

150 h.p.	$47.04 per h.p. per year.
200 h.p.	$41.75 per h.p. per year.

Caledonia

Although Caledonia has a supply of cheap natural gas, yet domestic and commercial lighting consumers have been taken on at a very satisfactory rate. This is reflected in the growth of the load taken from the Commission, which has increased from 27 h.p. for October, 1913, to 33.5 h.p. for the last current month. Financial reports indicate that the utility is on a sound financial basis.

Campbellford

The Town of Campbellford having been requested to give a proposition for supplying 300 h.p. to a paper mill located near its limits, requested the Commission's advice in the matter. A report was made on the town's ability to supply the power required, and also as to the extensions necessary. Estimates were prepared covering this construction, which were submitted.

Having explained the various details covered by the estimates, the Commission was asked to assist the Municipality in obtaining a contract for power with the paper company, and also to draw up specifications covering the equipment to be installed. Negotiations in regard to this agreement are still pending. No action has been taken in preparing the specifications, since it has been deemed advisable to first decide the source of supply for Havelock.

Recommendations have been made to the Municipality in regard to the management and operation of the system within its limits.

Carleton Place

The following estimated costs of different amounts of power transmitted to Carleton Place from Ottawa, together with power to Smith's Falls, were prepared and submitted:

With Carleton Place taking 100 h.p. and Smith's Falls 500 h.p.—$48.84 per h.p. per year.

With Carleton Place taking 200 h.p and Smith's Falls 1,000 h.p.—$32.18 per h.p. per year.

With Carleton Place taking 200 h.p. and Smith's Falls 2,000 h.p.—$27.39 per h.p. per year.

These rates were for power delivered to Carleton Place at a voltage suitable for distribution within its limits.

Chapleau

The franchise for the operation of the electric light plant in Chapleau being about to expire, the Commission was asked to act in an advisory capacity in drawing up a new agreement. A report was prepared, covering the condition and operation of the system and a proposed agreement was submitted to the Commission for comment. After going into all of the details, a new form was prepared and forwarded to the Municipality.

Chatham

Negotiations for the purchase of the plant and equipment of the local distribution company in Chatham, were carried on unsuccessfully until early in August. Since it was apparent that a satisfactory arrangement could not be reached the City decided to construct a municipal distribution system. A by-law authorizing an issue of $90,000.00 in debentures for this purpose was recommended. This was carried on October 12th by a large majority. A local superintendent and construction superintendent have been appointed, and plans covering construction are now in the course of preparation.

Chatsworth

Chatsworth was advised that 75 h.p. could be delivered to the village at the rate of $30.71 per h.p. per year. This estimated cost was for power delivered at a voltage suitable for local distribution based on the assumption of Owen Sound taking 1,500 h.p. and Markdale 150 h.p.

Later, after an investigation had been made of the power requirements of other municipalities in this district, the estimated cost of $28.85 per h.p. per year was submitted.

The enabling by-law will be submitted at the coming municipal elections.

Chesley

The enabling by-law was carried at the January elections by a large majority. Although Chesley is supplied with light, power and street lighting by a private company, it was proposed that the town install a street lighting system to be supplied with power generated by steam until such time as power would be available from the Commission. Tenders were obtained covering the materials and apparatus that would be required which were submitted

After investigating the power situation in Municipalities in Grey and Bruce Counties, they were advised that 400 h.p. could be delivered at the rate of $40.57 per h.p. per year.

Chesterville

Construction work was completed in this municipality and power supplied on February 7th, a temporary service being given by transmitting power at 2,200 volts from Morrisburg. This arrangement continued until the completion of the Winchester distributing station, since which time service has been given under permanent conditions.

A representative has visited Chesterville at regular intervals to assist the local officials and advised them on various details of management.

The Village has been granted permission to supply the rural district adjacent to its limits.

Chippewa

The following rates, covering different amounts of power delivered to the municipality at 26,000 volts were submitted:

2,000 h.p.	$12.50 per h.p. per year.
3,000 h.p.	$12.00 per h.p. per year.
6,000 h.p.	$11.50 per h.p. per year.

Clinton

The original plans for remodelling the distribution system were drawn up in accordance with the desire of the municipality to operate its old system by driving a generator with a synchronous motor operating on Hydro-Electric power. It was later suggested that the cost of operation would be less if the distribution system were changed over to transmit the power as delivered by the Commission. A report was prepared, comparing the costs of the two proposed systems, which showed that the latter would be the more economical. This scheme was approved by the municipality and instructions were issued to have the construction done accordingly.

The work on the distribution system was completed and power was delivered on February 15th.

A schedule of rates for use in billing power and lighting consumers, was submitted to Clinton.

Having been requested to prepare an estimate of the cost of giving lighting service at Holmesville, a small village in Goderich Township near Clinton, a

representative visited that district and reported on the local requirements. An estimate was prepared of the cost of giving the service by extending the Clinton system and a schedule of rates prepared and submitted.

The load taken by Clinton has shown a steady increase, that taken during the last current month being 95 h.p.

Coldwater

Reports of operation show Coldwater to be on a firm financial basis, although the growth of the load has not been as great as anticipated. The present load is 44 h.p.

Collingwood

Collingwood has made substantial increases to the number of power and lighting consumers during the year. The load taken during the last month was 370 h.p., the maximum for 1913 being 288 h.p. There are prospects of further growth in the load during the coming year.

Operating reports show the department to be on a firm financial basis. A representative has kept in touch with the details of the management of the utility, and has rendered engineering assistance in connection with the distribution system and installation of the power consumers' equipment.

Conestogo

See report on St. Jacobs.

Creemore

A rate of $54.13 per h.p. per year was submitted to Creemore, this being for 75 h.p. delivered at a voltage suitable for distribution within the village. The municipality was also advised that $7,500.00 would be required to purchase the system then operating, and to remodel and extend it to meet present needs.

The enabling by-law and a debenture by-law were carried on January 16th.

A form of agreement covering the delivery of 75 h.p. to Creemore was prepared and submitted to the village council and signed early in February.

Instructions were issued covering the work to be done in the village, the Commission having been requested to take charge of the re-construction.

Power was delivered to Creemore on October 21st, everything being in readiness for its reception at that time. A schedule of rates for use in billing power and lighting consumers, was drawn up and submitted. Assistance is being given the local officials in an endeavor to work up a power load.

Dorchester, North Township

A contract has been obtained from a manufacturer in this township, located near the line being built to serve the township Village of Dorchester, and preparations are being made to give service at this point. Contracts are also being obtained for rural service along this line as well as along the line serving Thamesford.

Dresden

The Town of Dresden was advised that the estimated cost of power was $43.00 per h.p. per year for 200 h.p., and that $9,500.00 would be required to cover the cost of remodelling the local distributing system. A by-law authorizing an issue of this amount in debentures was carried on July 20th by a large majority.

A contract covering the delivery of power to Dresden was signed early in September. Instructions have been issued for the reconstruction of the distribution and street lighting systems. This work will proceed as soon as the materials have arrived.

A schedule of rates for use in the municipality for billing power and lighting consumers was drawn up and submitted.

Drumbo

The Police Village of Drumbo was advised that $4,500.00 would be required to instal a complete distributing system within its limits, and on February 9th a by-law carried by a large majority authorizing an issue of debentures for that amount.

A form of agreement covering the delivery of 25 h.p. at an estimated cost of $40.75 was prepared and submitted. This was signed about the middle of April.

Drumbo's distributing and street lighting system has been completed and is ready to be put into service upon the completion of the Commission's transmission line and transformer station.

Dundas

The new street lighting system in Dundas was installed under the supervision of the Commission, a portion of it being ready for service on December 1st, the date of expiration of the old street lighting franchise.

As the Police Village of Ancaster desired electric service, it was proposed that Dundas take care of the business. After submitting estimates of costs, it was arranged that Dundas handle the extension, using a schedule of rates as recommended. This extension has been built and is now operating. (See report on Ancaster Village.)

Permission was given Dundas to serve certain lighting consumers in Ancaster Township along the lines to Ancaster Village and West Hamilton, at rates approved by the Commission. A similar arrangement was made to give service to the township Villages of Bullock's Corners and Greensville.

Dundas municipal load has grown from 268 h.p. taken during 1913 to 312.5 h.p. for the last current month. This is in addition to the loads taken by private corporations at Dundas directly from the Commission. On account of this, and also of possible further increase in the near future, it was deemed advisable to move the Dundas stepdown transformers from the Commission's inter-switching station near the corporation to a substation to be located within the limits and centrally to the power load. Steps are being taken to have this work done immediately under the supervision of the Commission.

A number of minor details in connection with the management and operation of the Dundas utility were referred to the Department for advice. The operation in Dundas has been very satisfactory, reports showing the utility to be in a healthy financial condition.

Durham

In accordance with estimates of the cost of power to municipalities from the Eugenia Falls development, Durham was advised that 2,200 volt power could be delivered at the following rates:

125 h.p.	$33.97 per h.p. per year.
500 h.p.	$24.99 per h.p. per year.

Elmira

A representative has visited Elmira at regular intervals to advise the local officials on various questions relative to the management of this utility. So far motors aggregating 86 h.p. have been connected to the lines, while the total load has reached 107 h.p. Operating conditions in Elmira are quite satisfactory, and the utility is on a firm financial basis.

Elmvale

The operation in Elmvale has been satisfactory during the year, and the utility is on a firm financial basis. A number of new power consumers have been obtained and are being supplied. The present load is 42.5 h.p.

The village has requested permission to serve the surrounding country, which includes a number of unincorporated villages. This proposition is being investigated.

Elora

The enabling by-law and a money by-law to authorize an issue of $10,000.00 of debentures were carried by large majorities early in November. A form of agreement covering the delivery of 200 h.p., at an estimated cost of $33.97 per h.p. per year, was drawn up and submitted to the municipality. This was signed on November 14th.

Instructions were issued for the construction of a transformer station for the village and remodelling of its distribution and street lighting systems.

The village requested permission to give rural service to prospective consumers in the township of Nichol, close to the transmission line being built to Elora; this was granted, the rates to be used being in accordance with the Commission's recommendations. A form of agreement covering this extension was drawn up and signed.

A schedule of rates for use in billing power and lighting consumers and also for street lighting was drawn up and submitted. Construction was completed and power was delivered on October 22nd.

Assistance is being given the local officials in working up a power load, and in regard to various details of management of the utility.

Embro

The village of Embro was advised that power could be delivered at a voltage suitable for distribution at the following rates:—

50 h.p.	$52.80 per h.p. per year.
100 h.p.	$39.85 per h.p. per year.

and that the estimated cost of remodelling the distribution and street lighting systems was $6,141.00.

A by-law to authorize an issue of $6,000.00 of debentures was carried on April 24th by a large majority. A contract covering the delivery of 100 h.p. at an estimated cost of $39.85 per h.p. per year was prepared and submitted. This was signed early in May.

The reconstruction of the Embro system was begun early in August, work being carried on under the supervision of the Commission, plans covering the work to be done having been previously drawn up and materials delivered. Con-

struction within the village has been completed and is in readiness for use upon the completion of the Commission's transmission line and distributing station. A schedule of rates for use in Embro for billing power and lighting consumers has been drawn up and submitted to the municipality.

Embrun

An estimated cost of $34.46 per h.p. per year was submitted to the Police Village of Embrun, covering the delivery of 150 h.p.

Esquesing Township

Previous to the use of Hydro-Electric power by the Village of Georgetown, service had been given in a section of this township by the company then operating. It was recommended that Georgetown continue to handle this business, and the necessary extensions have been built and put into operation.

(See report on Georgetown.)

Etobicoke Township

It was recommended that the following extensions be built in this township:—

An extension to serve additional consumers in the Humber Bay district.

An extension along the Lake Shore road, west from New Toronto.

An extension north from Weston, to serve the Scarlett Road district.

These extensions have all been built and are in operation, it having been arranged that each district be handled by the municipality from which the extension was made.

(See reports on Weston, New Toronto and Mimico.)

Fergus

The village of Fergus carried both the enabling by-law and a by-law to authorize an issue of $16,000 in debentures. The agreement covering the delivery of a 200 h.p. at an estimated cost of $33.97 per h.p. per year which had previously been submitted was signed about the middle of November.

An agreement for the purchase of the present system in Fergus was also drawn up and submitted.

The Council forwarded a resolution to the Commission requesting it to act as consulting engineer and to supervise the reconstruction. Acting in this capacity, instructions were issued covering the work to be done.

A schedule of rates for use in billing lighting and power consumers was submitted to the municipality. A representative has visited the municipality at regular intervals to assist the local officials in increasing the power load and in arranging details of management.

The system was completed and supplied with power on October 23rd, the initial load being 80.5 h.p.

The municipality requested permission to serve rural consumers located along the transmission line supplying power to the village, which was granted.

Finch

Having revised the estimates of the cost of delivering power to Finch, the municipality was advised that 75 h.p. could be delivered at the rate of $47.19 per h.p. per year, at a voltage suitable for distributing within the village.

Flesherton

According to the estimates of the cost of power to municipalities from Eugenia Falls, Flesherton was advised that 50 h.p. could be supplied at a rate of $25.28 per h.p. per year, for power suitable for distribution within the village limits. The Municipality was also advised to raise $5,500.00 for Hydro-Electric purposes. The enabling by-law and a debenture by-law for this amount were both carried by unanimous votes on October 29th.

Floradale

See report on St. Jacobs.

Ford City

A resolution by the village council of Ford City requested that the Walkerville system be extended to supply the village with power and lighting service. It was recommended that this be done and at the Walkerville rates. The extension is at present under construction.

Fort William

The following estimated costs were forwarded Fort William early in November for power delivered at 2,200 volts:—

1,000 h.p.	$24.00 per h.p. per year.
2,000 h.p.	$20.00 per h.p. per year.
3,000 h.p.	$19.50 per h.p. per year.
4,000 h.p.	$18.50 per h.p. per year.
5,000 h.p.	$18.00 per h.p. per year.

At the request of the municipality to prepare plans for a transformer station, instructions were issued outlining the requirements of the city as a guide in their preparation. Upon completion of preliminary drawings, a representative visited Fort William and obtained the information required to complete the plans and specifications.

Georgetown

The Village of Georgetown requested permission to extend its system into Esquesing township to give power and lighting service in the Village of Glen Williams, as had been done previously. It was recommended that the extension be built, a schedule of rates being also recommended for use in this secton. This extension has been built and placed in operation.

An application having been received from a manufacturer for a supply of power at Cheltenham in Esquesing township an agreement was drawn up covering the supply of 200 h.p.; the contract was signed; an extension has been built to Cheltenham, and power is now being supplied. The management of this extension has been turned over to Georgetown.

The operation of the Georgetown system has been very satisfactory during the year, financial reports showing substantial surpluses in all departments. A number of new consumers, both lighting and power, have been added to the system, and the load has grown from 83 h.p. for October, 1913, to 119.5 h.p. for the last current month.

Goderich

The Goderich distributing system was connected to the Commission's lines on December 28th. Since then assistance has been rendered the local officials in connection with the management and operation of the system, and in soliciting power consumers. After operating for a portion of a year it is found that the utility is on a firm financial basis. The load has grown steadily, 214.5 h.p. being taken during last current month.

Acting in an advisory capacity in regard to the installation of waterworks pumps, tenders were obtained covering the equipment required and a report was submitted to the municipality, which approved the Commission's recommendations and issued instructions providing for the preparation of plans for the installation.

Requests were received for electric light and power service in Colborne township close to the Goderich limits. After investigating conditions, it was recommended that the service be given. This extension has been turned over to Goderich for management and operation.

Grantham Township

During November a representative made a canvass of this township to secure applications for rural electric service. It was recommended that lines be built in a portion of the township north and east of St. Catharines to serve fifty-five consumers. At a meeting of the applicants the recommendations of the Commission were approved, and instructions were given the Township Council to pass the necessary by-law to enter into an agreement for the required power. The township passed this by-law on March 14th.

An agreement covering the delivery of power to Grantham Township was prepared and submitted. This was signed on May 12th. Instructions were then given to the construction department covering the work to be done.

Grimsby

A proposed franchise and an agreement for the supply of power to the Village of Grimsby were submitted to the Commission for comment. The various details were gone into carefully, and a report was forwarded to the municipality.

Guelph

The municipality requested permission to extend its distribution system to serve rural consumers close to the city limits. After investigating the proposition the Commission authorized Guelph to proceed with the proposed extension, giving a schedule of rates to be used in billing for the service.

A request was received from Guelph for a report on the advisability of installing electrically operated waterworks pumps; after making a study of the conditions and requirements a complete report was forwarded to the municipality.

The load taken by the City of Guelph has continued to increase satisfactorily, having now reached 2,024 h.p.; the maximum load for 1913 being 1,561 h.p. The financial operation shows considerable surpluses in all departments, and a substantial reduction in rates will probably be made.

Hagersville

The results obtained in Hagersville have been satisfactory, operating reports showing the utility to be in firm financial condition. The present load is 127.5 h.p. Although Hagersville has a supply of cheap natural gas, consumers of elec-

tricity, both for lighting and for power purposes, have been coming on rapidly. There is only one power user in the village who has not changed over, but it is believed that he also will become a consumer of electricity at an early date.

A request was received from a manufacturer in Cayuga township, near Hagersville, for a quotation on 100 h.p. Estimates were prepared of the cost of giving the service, and a proposition covering the supply was submitted.

Hamilton

The power load of the City of Hamilton has continued to increase steadily, the demand for the last current month being 6,340 h.p. (for October, 1913, it was 3,706 h.p.). Power and lighting consumers have continued to come on rapidly, service being given as soon as the municipality's lines were extended far enough to supply them.

The municipal street lighting system was put into operation on July 1st.

Reports on the operation in Hamilton show a surplus of revenue over expenses although part of the system is still under construction.

Requests for lighting and street lighting service were received from sections of Barton Township, close to Hamilton city limits. After investigating the probable requirements of these districts, it was reported that the business could be handled advantageously by the Hamilton Hydro-Electric Department, and arrangements have been made whereby Hamilton will take care of this business.

Hanover

The Town of Hanover carried the enabling by-law on January 5th.

It was estimated that 400 h.p. could be supplied to Hanover along with the other municipalities in the Eugenia Falls district at the rate of $33.90 per h.p. per year, for 2,200 volt power. The result of this estimate was forwarded to the municipality.

Harriston

In the estimates covering the cost of distributing power from Eugenia Falls, it was found that 400 h.p. could be delivered to Harriston at the rate of $45.15 per h.p. per year for power at 2,200 volts. This rate was submitted to the municipality.

Hespeler

A number of difficulties which had detrimentally affected operation in Hespeler have been cleared up during the year, resulting in the utility being placed on a firm financial basis, and operating reports now show a surplus of revenues over expenses.

Plans and estimates have been prepared covering suggested changes in the distribution system, which would simplify operation and effect economics, and recommendations have been made accordingly.

A request was received regarding supplying power to a manufacturing plant in Waterloo Township, near Hespeler. Estimates were prepared of the cost of giving the required service, and from this a schedule of rates was drawn up. A letter was submitted to the applicant outlining the conditions under which service could be given.

Huntsville

The results of a number of estimates, covering the delivery of different amounts of power to Huntsville from High Falls on the Muskoka River, and also from South Falls, under different conditions of contract, were submitted to the municipality early in July.

While in Huntsville for the purpose of discussing these, together with the proposition that would be submitted by the Commission, a representative made a report on the power situation, giving details of the equipment and operation of the local system.

Since Huntsville has taken up the power question with the object of serving a large tannery there, in addition to taking care of its municipal requirements, preliminary forms of agreements between Huntsville and the Commission and between Huntsville and the tannery were drawn up. These have been submitted for the consideration of the corporation and other parties interested. A final arrangement has not yet been arrived at, the proposition being still under consideration.

Ingersoll

Satisfactory progress is to be noticed in the year's operation in Ingersoll. A large number of lighting consumers have been connected to the system, resulting in an increase in the yearly surplus, although the rates in force have been much lower than those during the previous year. The increased load due to lighting has also resulted in a marked improvement in the load factor of the system, since the demand of the town is due to the power load carried.

Iroquois

As requested by ratepayers of the Village of Iroquois, a report was made on a proposed franchise to be granted by the municipality covering electric power and lighting service within the limits. An investigation was also made of the local conditions, which was covered by a report.

Kemptville

The enabling by-law was carried in Kemptville at the January elections by a large majority.

Kenmore

The following estimated costs of power were submitted to the Police Village of Kenmore:

75 h.p.	$42.06 per h.p. per year.
125 h.p.	$36.71 per h.p. per year.

These rates were for power delivered to the municipality at a voltage suitable for distribution within its limits.

Kingston

In accordance with a request from the municipality, a valuation was made of the generating plant and distributing system of the Kingston Public Utilities, which was submitted.

Preliminary to submitting a new schedule of rates in Kingston for use in billing power consumers, a report was made on the municipal generating plant, giving full details of operating costs and the load carried. From this a schedule of rates was prepared and submitted.

The owner of a generating plant at Kingston Mills entered into negotiations for the City of Kingston to use his surplus power until such time as power would be available from the Commission. The arrangements under which this power is to be delivered are at present in making, the Commission acting in an advisory capacity for the municipality.

London

The London load has continued to increase very rapidly during the year, the maximum of 3,391.5 h.p. for 1913 having grown to 5,047 h.p. for the last current month, which exceeds the London contract amount, viz., 5,000 h.p., and has been obtained in the face of keen competition.

Assistance was rendered London in drawing up an agreement covering the supplying of power to the London Street Railway by the municipality. After this was signed they were assisted further in laying out preliminary plans, choosing equipment and giving instructions as to its installation.

In response to a request an estimate was prepared of the cost at which different proposed systems of street lighting could be operated as extensions to the present system.

It was proposed that the supplying of power to the London Hospital for Insane, which was being taken care of by the Commission, be transferred to the City of London. Negotiations to this end were entered into, with the result that this arrangement was made, the Hospital continuing to receive its power at the same rates as given by the Commission.

Lucan

The Village of Lucan was advised that $7,500.00 would be required to cover the cost of a local distributing system and also that 100 h.p. could be delivered at an estimated cost of $47.74 per h.p. per year for 4,000 volt power. A debenture by-law for the above amount was carried on June 26th.

An agreement covering the delivery of 100 h.p. at the rate submitted was forwarded to the municipality. This was signed on June 30th.

Plans were drawn up covering a municipal distribution system, and instructions issued covering the installation as soon as the municipality's approval was received.

Markdale

This municipality was advised that 150 h.p. could be delivered from the Eugenia Falls development at an estimated cost of $23.02 per h.p. per year.

Midland

Satisfactory progress is to be noted in the operation of the Midland municipal system, both as to finances and load, in which latter the demand has increased from 315 h.p. taken during 1913, to 391 h.p. for the current year. Further contracts for large blocks of power have been obtained and preparations are now being made to give service.

Milton

Assistance was rendered Milton in soliciting new power consumers, and to laying out lines to serve them.

Applications were received for power and lighting service in Esquesing Township in districts close to the Milton town limits. It was proposed that Milton serve these districts, and negotiations to this end are now in hand.

A number of difficulties have been adjusted, and the utility has been placed on a very satisfactory financial basis.

Mimico

Mimico has continued to show very satisfactory results, both as to financial conditions and load, the latter having grown steadily from 71 h.p. for October, 1913, to 114 h.p. for the last current month. Additional demands of about 300 h.p. have also been taken from the Mimico Distributing Station, from which Mimico benefits indirectly.

Assistance has been given Mimico in laying out extensions to serve new districts, both in the village and in certain portions of Etobicoke Township, close to the village limits.

Mitchell

Although there have been no new developments in Mitchell during the year, yet reports show the utility to be on a very satisfactory basis financially, there being a fair margin of profit from the operation of the system.

Mount Brydges

Further estimates having been made of the cost of power to Mount Brydges, the rate, $50.42 per h.p. per year, was submitted. This was on the basis of Mount Brydges taking 25 h.p. at 2,200 volts, Lambeth 70 h.p. and Strathroy 200 h.p. They were advised later that the same amount of power could be delivered at 4,000 volts for $47.12 per h.p. per year.

The municipality was also informed that $4,220.00 would be required to cover the cost of a distribution and street-lighting system, and instructions have been given as to the preparation of the enabling and money by-laws.

Mount Forest

In accordance with the estimates of the cost of power to municipalities from the Eugenia Falls development, Mount Forest was advised that 400 h.p. could be delivered at a cost of $34.51 per h.p. per year, at a voltage suitable for distribution within the town limits.

New Hamburg

There have been no developments of interest in New Hamburg during the year. The operation of the utility has been satisfactory, there being a fair margin of earnings in excess of expenses.

New Toronto

The construction of the New Toronto distribution and street-lighting system, as originally laid out was completed about the end of January. Service had, however, actually been commenced before the beginning of the year, and each new section was made alive as soon as completed.

Assistance has been rendered the local officials in working up a load for their system. They have also been advised on various details of management.

Applications were received for service in certain portions of Etobicoke township close to the village. It was proposed that New Toronto take care of these, and an agreement covering the proposed township service was drawn up and signed. Extensions have been built to serve the original applicants in the township, while others are now in course of construction.

Niagara Falls

A further request for an estimate of the cost of delivering 5,000 h.p. to Niagara Falls having been received, the following rates were submitted:—

5,000 h.p. at 12,000 volts	$11.00 per h.p. per year.
5,000 h.p. at 2,200 volts	$12.00 per h.p. per year.

Norwich

A report was prepared covering the proposed waterworks installation and submitted to the municipality. This system was installed during the summer, the department acting in an advisory capacity in regard to the installation of electrical equipment for the operation of the pumps.

Petitions asking for estimates on rural service in North Norwich and Burford townships between Norwich and the Villages of New Durham and Hatchley were received. These estimates were prepared and it was recommended that Norwich take care of this business as was done in the case of the district between Norwich and Newark. The extensions are now under construction.

Reports of operation in Norwich show very satisfactory results financially. There has been no increase in the load taken from the Commission, but such power as is taken is so distributed among the various consumers as to give a very high load factor.

Ottawa

Since the load taken by the City of Ottawa was about to exceed the contracted amount new arrangements were drawn up and signed for the supply of from 5,000 to 20,000 h.p. for Ottawa and the surrounding district.

Power is to be supplied at 11,000 volts at the following rates in addition to the annual charges on the expenditure by the Commission for its delivery:—

Up to 8,000 h.p.	$14.00 per h.p. per year.
8,000 to 10,000 h.p.	$13.50 per h.p. per year.
10,000 to 12,000 h.p.	$13.00 per h.p. per year.
12,000 to 14,000 h.p.	$12.50 per h.p. per year.
14,000 to 16,000 h.p.	$12.00 per h.p. per year.
16,000 to 18,000 h.p.	$11.50 per h.p. per year.
Over 18,000 h.p.	$11.00 per h.p. per year.

During this year Ottawa has enforced the standard schedule of rates as recommended by the Commission. Assistance has been rendered the local officials in making the change and in overcoming difficulties arising out of the application of the new system of charges.

Owen Sound

An agreement was signed with Owen Sound for the supply of 800 h.p. early in November.

Owen Sound is to be supplied from the Commission's development at Eugenia Falls. There have been no developments in this municipality during the year other than making preparations to receive the power that will be delivered to them over the Commission's lines.

Paris

Construction work in Paris covering the lighting and street lighting systems was completed and made alive by temporary arrangement on January 8th.

A representative has visited Paris at regular intervals who has advised the local officials on details of management of the utility. He has also assisted them in soliciting power consumers. Present prospects are that a number of consumers of large blocks of power will be connected during the coming year.

An agreement covering the delivery of power by Paris to the City of Brantford for railway operation has been drawn up and submitted. (See report on Brantford).

Penetanguishene

An investigation was made of the advisability of the municipality installing a second electrically driven pump for its waterworks system, and recommendations were submitted to the local officials who in return asked the department to prepare specifications and to call for tenders on equipment as recommended. Instructions were issued accordingly.

Operating reports show very satisfactory conditions in Penetanguishene, with a fair margin of earnings in excess of expenses. Although financial depression has prevented the addition of much new load to the system that was anticipated at the end of the previous year, yet there is reason to believe that with the return of normal conditions considerable additional motor capacity will be connected.

Peterboro'

The construction of an underground street lighting distribution system with the installation of ornamental magnetite lamps in the business district was completed and put into operation during December.

Arrangements were made for a temporary supply of power to Peterboro at $18.00 per h.p. per year.

Peterboro took over the management of the power, lighting and street lighting systems on October 1st.

Steps have been taken towards arbitrating the value of the local plant taken over by the city. The inventory taken by the distributing company has been checked and an appraisal made. An inventory and valuation have also been made of the Company's stores department which is also taken over by the city. Arbitrators have been appointed to handle the case.

Plattsville

The Police Village of Plattsville was given an estimated cost of $49.27 per h.p. per year for 100 h.p., and advised that $5,200.00 would be required to cover the cost of a distribution and street-lighting system. A by-law authorizing an issue of debentures for this amount was carried about the end of January.

An agreement covering the delivery of 100 h.p. at the above estimated cost was submitted and signed about the middle of March.

Instructions were prepared covering the installation of the Plattsville distribution system.

A schedule of rates to be used in billing power and lighting consumers, was drawn up and submitted. Assistance is being given the local officials in working up power and lighting business so that the consumers will be ready for service as soon as the Commission's line and the Village distribution system are completed.

Port Arthur

In addition to advising the local officials on minor details of management, the following were taken up during the year:

Further recommendations were made covering changes in the Current River generating plant to improve its operation and permit of its being tied in with the Commission's transformer station. Action was taken by the City along the lines recommended, and construction work is now in hand.

Engineering advice was given in connection with the installation of new electrically driven waterworks pumps, and transmission lines to serve them. This work has been completed and the equipment placed in operation.

Financial reports show very satisfactory conditions as a result of the operation of the utility. Although a considerable reduction was made in the rates for power to consumers, there is still a fair margin of earnings for the year.

The average load taken from the Commission during the year was 2,730 h.p. while a demand of over 2,500 h.p. was made. This is additional to the power generated by Port Arthur at the Current River plant.

Port Colborne

The following estimated costs were submitted to this municipality:

100 h.p.	$43.33 per h.p. per year.
250 h.p.	$26.44 per h.p. per year.
500 h.p.	$20.86 per h.p. per year.

These rates were for power delivered at a voltage suitable for distribution within the corporation limits.

Port Credit

Further engineering assistance was given Port Credit in connection with extensions to the municipal distribution systems as well as advice on details of management. The operation of the village system has been quite satisfactory both as to finances and load which latter has increased steadily from 35.5 h.p. taken during October, 1913, to 55 h.p. for the last current month.

Port Dalhousie

This municipality requested permission to serve certain districts in Louth Township close to the village limits. The proposition was investigated and a schedule of rates submitted. A representative visited the municipality a number of times during the year to advise the local officials on the management of their system.

Reports show the financial condition of the utility to be quite satisfactory.

Port McNicoll

The estimates that were submitted gave the following results for 4,000 volt power:

25 h.p.	$34.00 per h.p. per year.
60 h.p.	$26.00 per h.p. per year.

It was advised that $3,200 would be required for the construction of a municipal distribution and street-lighting system. A contract has been signed by Tay township for power to this village.

Plans covering the distribution system were prepared and materials ordered. Construction work was started about the middle of October, and is being rushed ahead as fast as possible under the supervision of the Department.

(See report on Tay Township).

Port Stanley

In addition to advising Port Stanley on a number of minor details in reference to the management of the utility, an investigation was made of the method of handling the business in the summer resort districts to ascertain the advisability of giving service during the whole year, and the rates at which such service could be given. Recommendations were prepared, which were submitted to the municipality, and adopted.

Operating reports continue to show very satisfactory financial conditions in this village, there being a fair margin of earnings. It is also of interest to note that during the months of July and August the demand of the village system on the Commission's lines exceeded 140 h.p., while the load during the winter months approximated the contracted amount of 50 h.p. The average load for the whole year was 84 h.p.

Prescott

The work of reconstruction of the Prescott distributing system was carried on under the supervision of the department and was completed towards the end of March.

A schedule of rates was drawn up and submitted for use in billing power and lighting consumers. Assistance has been given the local officials in working up a power load as well as advice on a number of details of management and operation.

An investigation and report were made of the general operating conditions in Prescott and recommendations whereby material savings could be effected were submitted to the municipality.

The demand of the Prescott system on the Commission's lines has been growing steadily and has reached 180 h.p. during the last current month.

Preston

The local officials at Preston were advised on a number of minor details of management and operation of the utility in addition to the following:—

Preston had received a request for power service for a small load at Speedville, not far from the limits. Having been asked for advice on this question, a schedule of rates, based on estimates of the cost of making the extensions, were submitted.

Recommendations were made as to the rates to be used by Preston in billing consumers in suburban districts.

An investigation was made of the load conditions on the Doon line, to ascertain the advisability of making a reduction in the rates at present in use.

Financial reports show a very satisfactory condition in Preston, there being a fair margin of earnings, although the rates were reduced considerably. There has been but small increase in the load taken from the Commission, the additional power taken resulting in an improved load factor.

Princeton

In the report on Ayr it is stated that the estimated cost of 25 h.p. to Princeton was $69.95 per h.p. per year, for 2,200 volt power. This rate was submitted to the municipality early in December. They were also advised that $3,350 was required for the construction of the distribution and street-lighting systems. A by-law to authorize an issue of debentures for that amount was carried at the January elections.

An agreement covering the delivery of power to Princeton was submitted towards the end of February and signed.

Plans were prepared of the village distribution system and orders placed for materials. The system is at present under construction.

A schedule of rates for use in billing power and lighting consumers was prepared and submitted to the municipality.

Renfrew

The report submitted to Renfrew gave recommendations covering changes to be made in the street-lighting system. It also contained valuations of the plants and equipments of the local companies together with suggestions as to remodelling these systems to improve the service in the town. During March a representative visited Renfrew who explained the various details covered by the report.

As requested by the town further investigations were made and estimates prepared covering an ornamental street-lighting system in certain districts together with the cost of the system for the rest of the town if this arrangement were used. These estimates were submitted together with a report giving a general description of the proposed system.

A by-law authorizing an issue of debentures for $16,000.00 to cover the installation of the street-lighting system was carried on July 18th.

Assistance was rendered in fixing damages to lands and other property, due to the town's hydraulic development. This work included the valuating of the properties damaged.

Rockwood

There have been no developments of interest in Rockwood during the year.

New consumers have continued to come on at a satisfactory rate, which has resulted in the utility being placed on a firm financial basis.

Russell

After further investigating the power requirements of this district, Russell was advised that 350 h.p. could be delivered at an estimated cost of $30.05 per h.p. per year.

Sandwich

This municipality was advised that approximately $7,000.00 would be required to cover the construction of a local distribution system. The enabling by-law and a debenture by-law for this amount were submitted to the ratepayers at the January elections, but owing to a very active campaign by private interests both by-laws failed to pass.

Sault Ste. Marie

The municipality of Sault Ste. Marie submitted a schedule of rates proposed by the local distributing company in the event of its obtaining a new franchise, for the Commission's comments. After making a study of the proposed schedule, a report was submitted.

Later, when arbitration proceedings were started to fix a basis for the town's purchasing the distribution systems of the local company, the Commission was requested to make an appraisal of the equipment to be taken over. A representative visited the municipality and made an inventory of the system, from which a detailed statement of valuation was prepared and submitted.

Sault Ste. Marie has purchased the distribution and street-lighting systems from the local company, and is now operating the same as a municipally-owned utility.

Seaforth

Reports covering the operation in Seaforth show satisfactory results. Consumers of both light and power have continued to be connected to the system, which has been maintained in excellent condition. The finances of the utility continue to show a fair margin of earnings over expenses, with a substantial reduction in rates. There has been no marked increase in the load taken from the Commission, the power taken by new consumers having resulted in improving the load factor.

Shallow Lake

In the preliminary estimates of the cost of power to municipalities from Eugenia Falls, Shallow Lake was included for 800 h.p. It was found that this amount could be delivered at the rate of $30.92 per h.p. per year for 2,200 volt power. The results of this estimate were submitted to the municipality towards the end of February.

An agreement for the supplying of power to a prospective consumer near Shallow Lake is at present in course of preparation. The Company's acceptance or refusal of this agreement will be the controlling factor in the proposition of serving the village.

Shelburne

It was estimated that 300 h.p. could be supplied to Shelburne from the Eugenia Falls development at a cost of $39.19 per h.p. per year for 2,200 volt power, which rate was submitted.

Simcoe

At the request of the municipality a valuation was made of the privately owned street lighting system, and a report submitted. It was also advised that 200 h.p. could be delivered at the rate of $35.00 per h.p. per year, and that $40,000.00 would be required to cover the cost of installing a street lighting and distribution system. The enabling by-law and a debenture by-law for this amount were both carried on June 26th.

An agreement covering the delivery of 200 h.p. at an estimated cost of $35.00 per h.p. per year, was submitted. After this had been signed plans were prepared covering the proposed municipal system. These were approved by the local officials, and construction work is now progressing, the Department acting in a consulting and supervising capacity.

Smith's Falls

The following estimated costs were submitted for different amounts to this municipality, based on transmitting power to Smith's Falls and Carleton Place from Chaudiére Falls on the Ottawa River:

With Smith's Falls taking 500 h.p. and Carleton Place taking 100 h.p., $52.07 per h.p. per year.

With Smith's Falls taking 1,000 h.p. and Carleton Place taking 200 h.p., $34.02 per h.p. per year.

With Smith's Falls taking 2,000 h.p. and Carleton Place taking 200 h.p., $27.35 per h.p. per year.

St. Catharines

The enabling and debenture by-laws having been carried in St. Catharines, the Commission, in behalf of the municipality, entered into negotiations with the Ontario Power Company to purchase the company's distribution system, then operating in St. Catharines, and to obtain a supply of power. An agreement was finally reached in the middle of March. By taking over this distribution system, the municipality assumed the agreements for power service then held by the company. It was arranged that the company would supply power directly to the municipality until such time as the Commission would be in a position to handle the load.

An agreement covering the supplying of power to St. Catharines by the Commission was drawn up and signed. This will go into effect at such time as the Commission is able to deliver the power to St. Catharines, when the present temporary arrangement with the Ontario Power Company will be terminated.

A manager was appointed by the City of St. Catharines, who took charge of the system about April 1st. Since that time extensions have been built to the distributing system purchased by the municipality, so that a municipal distribution and street lighting system to serve the whole city is approaching completion.

St. Catharines obtained considerable load upon taking over its system, and this has been steadily increasing, due to the large number of consumers of both light and power who have started service.

St. Clements

See report on St. Jacobs.

St. Jacobs

The following estimated costs for power to municipalities from the Berlin-Elmira line were submitted, the rates being for power delivered at 4,000 volts:

St. Jacobs, 50 h.p.	$29.04 per h.p. per year.
St. Clements, 50 h.p.	$42.68 per h.p. per year.
Conestogo, 50 h.p.	$36.59 per h.p. per year.
Floradale, 40 h.p.	$51.57 per h.p. per year.

St. Jacobs was advised that 50 h.p. could be delivered at the rate of $36.26 per h.p. per year for 4,000 volt power transmitted from Elmira, and also that $4,312.00 would be required to cover the cost of a distribution of street lighting system.

St. Mary's

A report was prepared and submitted to the municipality covering changes that had been recommended for its distribution system. This also contained suggestions as to changes required in the street lighting system. The municipality

has remodelled the street lighting system as suggested, but has not done any construction work along the lines of the other recommendations.

In accordance with a request, a proposition was submitted for the supplying of power to a new cement mill to be erected near St. Mary's.

Although there has been no marked growth in the load taken by St. Mary's, reports show the utility to be in a very satisfactory condition both as to number of consumers connected and finances.

St. Thomas

The amount of power taken by St. Thomas has continued to show satisfactory growth during the past year. This load, which was 1,173 h.p. during October, 1913, has increased to 1,665 h.p. for the last current month. In this connection it will be remembered that the St. Thomas contract is for the delivery of 1,500 h.p.

In addition to advising the local officials on minor questions of management and operation of the system, a study was made of the conditions under which power was supplied to the street railway. In the report that was submitted to the municipality it was advised as to the operation of the station equipment, and recommendations were made as to changes and additions that should be made. A new system of charge for this power was also recommended.

Following the suggestion of erecting a transformer station in the southern part of the city, estimates were prepared of the cost of making this installation, which were submitted to the municipality.

A report was prepared and submitted on the street lighting system in St. Thomas, showing the details of costs for various styles of lamps in use and recommending changes to be made in the installation.

Operating reports show very satisfactory results for the year's business. A large number of new consumers of both light and power have been connected, which has necessitated increasing transformer and distributing equipment. Financial statements show a fair surplus in the face of a large reduction in rates made at the beginning of the year.

Stamford Township

The Council of this township proposed to take over the system of a distributing company operating in the district around Niagara Falls, and to operate it as a municipally owned plant under Hydro-Electric control. As a preliminary to entering into negotiations for the transfer of the equipment to the township, a valuation has been made of the company's property, a report on which has been submitted to the municipality.

Stayner

Reports on the first year of operation in Stayner show satisfactory results. Although the town took over a plant that had been operating some years, yet a large number of new consumers have been taken on and the load of about 30 h.p. that was taken during the first months has been increased to over 80 h.p. Financial statements show a fair margin of earnings over expenses.

Stratford

The Commission was requested to act in an advisory capacity in the purchase and installation of an additional pump for the waterworks system. An investigation was made of the requirements, preliminary to calling for tenders on equip-

ment. After quotations had been received recommendations were submitted for a guide to the municipality in placing the order. Plans were also drawn up covering its installation in the pumping station. The apparatus is now being installed.

Since the boilers of the waterworks steam auxiliary need replacing, a study is being made of the proposition of installing gasoline driven units to replace the present steam. Details have been obtained as to the size of the units that will be required, and instructions have been issued for obtaining tenders and other information.

Assistance has been rendered Stratford on a number of details of management of the utility. Reports show a continued satisfactory growth in the number of consumers, finances and load, which latter has increased from 791 h.p. for October, 1913, to 1,005.5 h.p. for the year just closed.

Streetsville

During 1913 two brick manufacturers located at Streetsville contracted with the Commission for power service and an extension was built from the line serving Milton to supply it.

It was deemed advisable that the village of Streetsville take over this business, and accordingly negotiations to this end were entered into early in the present year. The municipality was advised that the cost of the portion of the Commission's system to be turned over to them was $6,000.00, and towards the end of March a debenture by-law covering this amount and the enabling by-law were passed.

An agreement covering the supply of 200 h.p. to Streetsville, at an estimated cost of $26.00 per h.p. per year, was submitted to the municipality and signed towards the end of May.

The contracts for power were turned over to Streetsville soon after this, the village being allowed all benefits from the sale of this power from May 1st.

Stouffville

This municipality carried a debenture by-law at the January elections to raise $7,000.00 to acquire and reconstruct the local distribution system. Plans were prepared covering the work to be done, and the town having purchased the plant and equipment of the local company, reconstruction was commenced, the department acting in an advisory and supervisory capacity. This municipality is continuing the operation of the old steam plant until such time as the Commission can deliver power.

Strathroy

The enabling by-law was carried at the January elections by a large majority and a debenture by-law for $25,000.00 to be used for Hydro-Electric purposes, was carried on February 14th. An agreement covering the delivery of 200 h.p. at an estimated cost of $44.07 per h.p. per year, was submitted to the municipal officials and signed during March.

Plans were prepared covering the reconstruction of the distribution and street lighting system; the work has been completed under the supervision of the Department and the system is ready for connection to the Commission's lines.

A schedule of rates has been prepared and submitted to the municipality, and an effort is being made to work up a load among the power users.

Sunderland

Plans were prepared for the reconstruction of Sunderland's distribution system, and orders placed for the materials required. Construction work was carried on under the supervision of the Department and the system was completed and ready to receive power upon the completion of the Commission's lines. Power was delivered to Sunderland on October 16th.

A schedule of rates was recommended for use in this municipality for billing power and lighting consumers and assistance is now being given in working up a power load.

Tay Township

The residents of the township villages of Port McNicoll and Waubaushene being desirous of electric lighting and power service, the Township Council passed a by-law early in February to enter into a contract with the Commission for a supply. An agreement was drawn up and submitted, covering the delivery of 100 h.p., 50 h.p. being required by each village. This agreement was signed early in March.

(See reports on Port McNicoll and Waubaushene.)

Tavistock

Having been requested to prepare a further estimate on the cost of 100 h.p. to Tavistock, this was worked out and the rate of $49.50 per h.p. per year was submitted for 2,200 volt power.

On June 5th the village carried the enabling by-law and a debenture by-law for $6,000.00 to be used in acquiring and reconstructing the local distribution system.

An agreement, covering the delivery of 100 h.p. to Tavistock at the estimated cost of $49.50 per h.p. per year, has been drawn up. This, however, has not been submitted pending investigations to find if a larger load will be taken. Further estimates have been prepared of the cost of delivering the larger amount of power that may be required and also of supplying a small load at Shakespeare from this point. Schedules of rates have also been prepared for use in Tavistock and Shakespeare, if this larger amount of power is taken, for use in these investigations.

Thamesford

The distribution system in Thamesford was completed and made alive on January 27th. Since then assistance has been rendered the local officials in working up a power load, a schedule of rates having been recommended. Engineering advice was also given their new power consumers in choosing their electrical equipment and preparing plans covering its installation.

Although this municipality has been using electricity for only a portion of a year, reports show that the utility is already placed on a safe financial basis.

Thorndale

Construction work in this village was completed, and power delivrred on January 27th. Since then the local officials have been working up a power and lighting business, using rates that had been recommended.

A request was received for power service to a manufacturer in West Nissouri Township near the Commission's line serving Thorndale; after investigation an agreement was drawn up and submitted. This will be turned over to Thorndale as soon as service is given.

Tilbury

The enabling by-law and a debenture by-law authorizing an issue of $10,000.00 for Hydro-Electric purposes, were both carried early in February.

A valuation was made of the system of the local distributing company, on behalf of the corporation, for use in purchase proceedings. It was arranged, after extended negotiations that the town take over this system.

An agreement, covering the delivery of 250 h.p. at an estimated cost of $39.45 per h.p. per year, was submitted and signed early in May.

Plans covering the reconstruction of the municipal distribution are now in the course of preparation. This work will be carried on under the supervision of the Department.

Toronto

Further growth is to be noted in connection with the Toronto municipal system which is very satisfactory. There has been a large increase in the number of consumers, both lighting and power, which is reflected in the increase shown in the load taken from the Commission. This load has grown from the maximum of 17,997 h.p. taken during 1913, to 22,520 h.p. during the year just closed.

A few more extensions have been built to give suburban service in York Township under the arrangements made in 1912.

It was proposed that Toronto purchase the lines and equipment of a privately owned distributing company, operating in a portion of the city. A valuation was made of this system, a report on which was submitted to the local commission with recommendations.

Toronto Township

A number of extensions have been built to the Toronto Township system to serve new consumers, and a large number of new services connected to the system previously built. Prior to making each new extension, an estimate was prepared of its cost to ascertain whether it would be financially beneficial to the rest of the system if the applicants were given service. The number of the consumers in the township has been increased approximately 60 per cent.

The service in this township was started on a flate rate basis; this has been changed to a meter basis and meters have been installed in nearly all services.

Reports show the utility to be on a firm financial basis, there being a fair margin of earnings over expenses after the first year of operation. The load taken from the Commission's system has been increasing steadily, and has reached 126 h.p. during the last month covered by this report.

Uxbridge

As requested by the municipality, a report was made on the condition and operation of the plant and distributing equipment of the local electric light company.

Victoria Harbor

Upon the Commission's purchasing the generating plant and distributing system of the Simcoe Railway and Power Company, the system within this village also came under the Commission's control. A valuation will be made of that portion of the system within the village, after which it will be turned over to the municipality. The village has requested permission to serve some consumers outside its limits by building an extension to the system. After investigation the request was granted.

Walkerton

The following estimated costs were submitted to Walkerton for power delivered at 2,200 volts:

150 h.p.	$58.11 per h.p. per year.
250 h.p.	$39.66 per h.p. per year.

Walkerville

The enabling by-law and a debenture by-law to authorize raising $58,259.00 for Hydro-Electric purposes were both carried on December 6th. Soon after this the form of agreement covering the delivery of power to Walkerville, which had been previously submitted, was signed. This agreement is for 1,500 h.p. at an estimated cost of $38.00 per h.p. per year.

The municipality requested the Commission to make a valuation of the distributing system of the local company, to be used in negotiations for its purchase by the corporation. An inventory and appraisal were made which were submitted in a detailed report. After a number of conferences between the company and the local Commission, which were attended by a representative, an agreement was finally reached. The municipality assumed the operation of this system on August 20th.

A superintendent was appointed to take care of new construction in the town, working under the supervision of the Department. A site was chosen for a municipal distributing station and instructions were issued, covering the equipment to be installed.

On October 10th a second debenture by-law for $26,000 for the purchase of the local street lighting system was carried.

Hydro-Electric power was delivered to Walkerville on October 29th.

A resolution by the Council of Ford City recommended that Walkerville construct a distribution system within its limits. After investigating conditions, it was recommended that this agreement be entered into. Construction work in Ford City is now in progress.

Wallaceburg

The town was advised that $25.000.00 would be required to take care of the installation of a new power and lighting distribution system and street lighting system. An estimate was also given, covering a portion of the street lighting system for certain districts that had been omitted, where an ornamental lighting system was required. This estimate gave an addition of $3.855.00.

A report was prepared on the franchise of the local distributing company and also a valuation of its electric system, and an estimate was prepared of the cost of remodelling the lines for use with Hydro-Electric power. This report and estimate were submitted to the municipality.

The enabling by-law and a debenture by-law for $25,000.00 were both carried on May 28th.

An agreement covering the delivery of 500 h.p. at an estimated cost of $38.45 per year, was drawn up, which was signed by the municipal authorities on June 30th.

The municipality has taken over the distributing system of the local company and this is being remodelled, the work being carried on under the supervision of the Department, which has prepared plans covering all details.

Rate schedules were prepared and recommended for use in Wallaceburg in billing power and lighting consumers for service.

Waterdown

Further growth is to be noted in the load taken by Waterdown during the year; this has increased from 40 h.p. taken during 1913, to 72.5 h.p. for the last current month. It will be remembered that Waterdown's contract is for 50 h.p. The load taken by the Dominion Sewer Pipe Company also shows a similar increase, having grown from 248 h.p. to 362.5 h.p.

In addition to advising the local officials on various details of management, a study was made of a proposition to serve a section of East Flamboro Township, known as the Plains Road district, from which petitions have been received. It was recommended that Waterdown take over this business, and an agreement was entered into accordingly. The Waterdown system has been extended to cover the district and service is now being given at rates that had been recommended.

Waterford

The enabling by-law and a debenture by-law for $7,000.00 to be used for Hydro-Electric purposes, were both carried at the January elections.

An agreement was drawn up and submitted, covering the delivery of 150 h.p. at an estimated cost of $37.00 per h.p. per year, which was signed by the municipal officials on September 8th.

Plans covering the reconstruction of the municipal distribution system are being prepared. This work will be carried on under the supervision of the Department.

Waterloo

Reports covering the operation of the Waterloo municipal system show satisfactory results for the year, with a fair margin of earnings over expenses, although a substantial reduction was made in the lighting and power rates. There has been no increase in the load taken from the Commission's system, the additional load that has been taken by new consumers having resulted in increasing the load factor.

A petition was received asking for rural service in a section of Waterloo Township, close to the town limits of Waterloo. It was recommended that Waterloo take charge of this business. An extension has been built to the Waterloo system and service is now being given in the section covered by the petition.

Waubaushene

The Council of the Township of Tay were advised that 50 h.p. could be delivered to Waubaushene at an estimated cost of $29.75 per h.p. per year, and that $3,000.00 would be required for a local distribution system.

After the township had signed a contract for a supply of power, plans were drawn up, covering the village installation. Construction work is now approaching completion, the Department acting in an advisory capacity.

(See report on Tay Township.)

Welland

In addition to advising the local officials on questions of management of the system, they were assisted in soliciting additional power load. A number of new contracts were obtained, some of which were for large blocks of power. Engineering assistance was given in laying out extensions to serve these new consumers, and to some of the new power consumers in choosing their equipment and in preparing plans covering their installations. A large number of lighting consumers have also been connected.

The load taken by Welland has increased to approximately 600 h.p. With the addition of some new consumers, not yet connected, it is anticipated this load will exceed 1,500 h.p. The Commission is also serving a manufacturer near Welland on a contract for 16,000 h.p., the load on which has reached 15,677 h.p. Welland benefits by this load.

Financial reports show satisfactory results in Welland during the year, there being a fair margin of earnings over expenses.

Wellesley

The following estimated costs were submitted for power to the Police Village of Wellesley:

50 h.p.	$45.69 per h.p. per year.
75 h.p.	$37.22 per h.p. per year.

These rates were for power delivered at 4,000 volts.

Weston

Further growth is to be noted in the load taken by Weston, it having increased from 151 h.p., the greatest amount taken during 1913, to 195 h.p. during the year just closed. Reports show the utility to be in a very satisfactory condition, both as to operation and finances.

Petitions were received from Etobicoke Township, asking for power and lighting service, near Weston, in what is known as the Scarlet Road district. It was recommended that Weston take care of this extension at rates that had been suggested. This arrangement has been made and service is now being given to a portion of this district, while further extensions are under construction.

Williamsburg

The Police Village of Williamsburg was advised that 45 h.p. could be delivered at $26.00 per h.p. per year.

The enabling by-law was carried on February 16th by a vote of 39 to 1.

An estimate was prepared of the cost of installing a distribution system in the municipality. This showed that $3,000.00 would be required to cover the work and the municipality was advised accordingly. After going over the details with the village trustees, it was found that this estimate could be reduced to $2,750.00. A debenture by-law for this latter amount was carried on October 19th unanimously.

An agreement was drawn up and submitted covering the delivery of 20 h.p. at an estimated cost of $34.66 per h.p. per year.

Winchester

Hydro-Electric power was delivered to Winchester on December 18th, when the street lighting system was put into operation, temporary service being given from Morrisburg. Upon the completion of the Winchester distributing station on July 18th the service was changed over to the permanent arrangement. The load taken by the village has reached 55 h.p., and every effort is being put forward to work up a substantial load in this district. Meetings have been held in rural districts to interest the farmers in the use of electricity; also a demonstration was made at the local Fall Fair to encourage the use of power consuming household appliances.

Windsor

The municipality requested the Commission to make a valuation of the plant and distributing equipment of the local company, to be used in purchase proceedings. An inventory and valuation were made, and were submitted to the city officials in a detailed report, together with recommendations. After extended negotiations to purchase the property of the local company, it was finally decided that an agreement could not be reached.

The municipality then decided to construct a new distributing system of its own. A superintendent was recommended and a construction department organized. Plans were laid out covering the system and orders were placed for the materials required. Construction work was carried on under the supervision of the Department.

Instructions were issued covering the installation of the municipal distributing station.

An underground distributing system, covering certain districts, was designed and laid out, and the necessary materials purchased. The construction of this system was also supervised.

Hydro-Electric power was delivered to Windsor on September 12th, when the street lighting system was put into operation. Since then a large number of both lighting and power consumers have been connected. As a result, a load of 590 h.p. was taken during the last current month.

Woodbridge

Woodbridge was advised that 100 h.p. could be delivered for $33.83 per h.p. per year. It was also advised that $5,207.75 would be required to cover the cost of a local distributing and street lighting system.

The enabling by-law and a debenture by-law for this amount was carried on May 6th, and on May 7th an agreement covering the delivery of 100 h.p. at the rate submitted was signed by the village officials.

Plans were prepared of the municipal distribution system and instructions were issued for the construction of a distributing station.

Construction work in the village is at present in hand and nearing completion under the supervision of the Department. Temporary service has been given since October 12th.

A schedule of rates has been drawn up and submitted to the municipality for use in billing power and lighting consumers.

Woodstock

Conditions have continued very satisfactory in Woodstock during the year. Operating reports show a fair margin of earnings over expenses, although a sub-

stantial reduction was made in the rates. There have been no developments of importance within the municipality, although assistance has been rendered in connection with a number of minor details.

Woodville

The distribution system was reconstructed under the supervision of the Department, and was ready for service upon the delivery of power from Wasdell's Falls. This service was commenced on October 19th.

A schedule of rates was drawn up and submitted for use in billing consumers for lighting and power service. An effort is being made to work up a load in this municipality with the assistance of the Department. Instructions are also being given in regard to the management and operation of the system.

Yarmouth South Township

A small extension has been built to give rural service in a section of this township close to the City of St. Thomas. This extension is being operated by St. Thomas, using rates recommended by the Commission.

York Township

Further extensions have been built in this township to serve districts close to the limits of the City of Toronto under the agreement made in 1912. In addition to these, petitions have been received from districts lying farther out which could not be handled as suburban service. Estimates have been prepared covering each district to ascertain the advisability of making the desired extensions.

Zorra East Township

The various details in connection with the estimate that had been prepared of the cost of serving petitioners, were discussed with the local officials, and at a meeting held towards the end of January, which was attended by the petitioners, it was decided to make a canvass of the township for contracts. A committee was formed to conduct this canvass and instructions were given them.

Service is being given to certain rural consumers in this township close to Woodstock, from extensions to the Woodstock system.

MUNICIPAL ACCOUNTS

The actual results from municipal distribution of Hydro power are shown in the tables submitted in this section. In accordance with the requirements of the Ontario Government the municipal year, with the exception of London, ends on December 31st. The tables which follow under "Municipal Accounts" cover the calendar year ending December 31st, while all other sections of the annual report deal with the fiscal year ending October 31st.

The work of standardizing the electrical accounts of the Hydro-Electric municipalities commenced in 1912 has been continued. During the year new books were opened in Brantford, Windsor, Peterborough, St. Catharines, Goderich, Walkerville, Paris, Prescott, Clinton, Fergus, Elora, Winchester, Beaverton, New Toronto, Cannington, Chesterville, Streetsville, Sunderland, Creemore, Woodville, Thamesford, Thorndale, Woodbridge, Ayr, Drumbo, Plattsville, Princeton and Toronto Township, and the local officers instructed in the proper handling of the same.

A system of accounting for the public utilities of Kingston was prepared and submitted to the city.

A special report was made on the accounts of the Chatham Gas Co. and the Wallaceburg Electric Co. in connection with the proposed purchase of these systems by the Municipalities.

The Uniform Classification of Accounts for Electric Utilities issued by the Commission in 1911 has been revised during the year, and will be ready for distribution at an early date. The revised edition covers some important features which were omitted in the first issue, such as debenture and sinking fund payments chargeable against revenue, sinking fund reserves, depreciation, etc., and is now made up in three sections, all closely related, and adapted to the requirements of cities, towns and villages respectively. In actual practice it was found that the elaborate system outlined in the original issue was impracticable in the smaller municipalities.

A periodical inspection has been made of the electrical accounts of all Hydro-Electric municipalities, our accountants assisting the local officers by suggesting better or simpler methods of office routine, and in the case of smaller towns and villages, where the utility is in charge of men of little or no bookkeeping experience, actually doing all the accounting and some of the billing.

The system of monthly balance sheets and operating reports inaugurated has enabled the Provincial Commission to keep in close touch with the local conditions, and from these reports and other data which is collected or worked up by the auditors of municipal accounts, the capital costs and operating expenses are periodically divided into the principal revenue accounts, domestic light, commercial light, power and street light, these in turn being set against the respective revenues for the purpose of rate adjustment.

From this data the Hydro-Electric Power Commission is in position to authorize and enforce a schedule of selling rates in each municipality which makes each of the above-named revenue departments self-supporting, so that an excessively high rate in one does not take care of a deficit in another, to the manifest advantage of the latter.

The eight statistical reports which follow were prepared to give a comprehensive view of the present status of the electric utilities and the result from operation in the sixty-nine municipalities in which the service has been installed sufficiently long to justify a report.

The municipalities have been listed in the order of their size according to Municipal Bulletin No. 8, Bureau of Industries of the Ontario Department of Agriculture; the populations are shown and the statistics are prepared to permit an intelligent comparison of operating results in municipalities where conditions are similar. This is resulting in a friendly rivalry between the municipalities for an increased load, an efficient and economical administration, and an intelligent effort to improve the load factor, which is so essential to low selling rates.

Statement "A" is a comparative condensed balance sheet of each municipality as at December 31st, 1913, and December 31st, 1914, showing the plant cost in natural subdivisions, and other items making up the total assets. The true or quick liabilities, such as debenture balance, bank overdraft and accounts payable, are totalled separately before including such reserve accounts as debentures paid, sinking fund reserve, depreciation reserve and surplus. In this way the relative increase in plant value and net debt during the year in any municipality can be quickly determined.

The percentage of net debt to plant cost at the end of each year has been worked out, and shows a marked decrease. Special attention is called to this very interesting and gratifying result of municipal operation.

As it is the practice of the municipalities to invest in plant extension, not only the surplus but the depreciation reserve as well, rather than to place the money in bank at a low rate of interest and issue new debentures for extensions at a high interest rate, the total credits to depreciation reserve and surplus practically represent plant constructed from revenue, or uncapitalized plant.

Statement "B" is a condensed operating report for the year ending December 31st, 1914, showing the result in each municipality. The population and the number of consumers in each class is also given to facilitate comparisons. In some cases where the power was turned on subsequent to January 1st, the proportion of the annual fixed charges corresponding to the period of operation has been used, and in other municipalities where the operation covers a very short period, and no actual payment has been made, the fixed charges have been omitted entirely to simplify the accounting in future years and avoid the necessity for annual adjustments.

In some municipalities where it requires from six weeks to two months to close the books for the year, the figures are taken from the trial balances, which are substantially correct, but subject to revision on final audit.

Ordinarily a municipality is not considered self-sustaining unless the revenues are sufficient to meet all operation and maintenance charges, all the interest, sinking fund or principal payments on debentures, and additions to plant to the extent of five per cent. of the capital in lieu of depreciation. This percentage is based on the usual type of construction; special features, such as concrete poles or underground work, or an unusually large amount of overhead work, would require a lower or higher rate.

A study of Statement "B" will show that in but two instances has the revenue been insufficient to meet all operating, maintenance and fixed charges, and in these cases steps have been taken to correct the peculiar local conditions responsible for the small loss. In almost every case the surplus is much more than sufficient to provide for full depreciation.

Statement "C" shows in detail the revenues and expenses which are summarized in statement "B" comparative with the operation in other municipalities of the same size for 1913 and 1914. In comparing the cost of power purchased, the varying price per horsepower paid must be taken into consideration.

Statement "D," showing the revenue for the years 1912, 1913 and 1914, and the number of customers in each class of service at the end of each year, is intended to illustrate the rapid expansion of the service in the municipalities where the operation covers a period of two years or longer.

Statement "E" is prepared to show the approximate installation and annual cost per lamp and per capita of the street lighting service in cities, towns and incorporated villages where Hydro service has been installed. The figures are for the calendar year ending December 31st, 1914.

Statement "F" will show the actual cost per kw-hr. in domestic and commercial service, including all floor space and installed capacity loadings, and, where it has been possible to compute it, what this service would cost at the rates in effect prior to the introduction of Hydro, and the hypothetical saving to light users only.

Statements "G" and "H" show comparatively the cost of power to the municipalities, the selling rates for power and light in 1912, 1913 and 1914 and the recommended rates for 1915.

The accounts of 69 municipalities have been consolidated into one balance sheet on the standard form as at December 31st, 1914, as follows:—

Assets:			
Lands and Buildings	$791,732 20		
Sub-Station Equipment	1,476,087 84		
Distribution System, Overhead	3,422,763 93		
" " Underground	807,153 53		
Line Transformers	787,613 52		
Meters	1,172,475 11		
Street Lighting Equipment, Regular	1,071,255 37		
" " " Ornamental	270,386 55		
Miscel. Equipment and Const. Expense	2,062,035 90		
Steam or Hydraulic Plant	420,108 33		
Old Plant	478,881 56		
Other Miscellaneous Assets	140,631 56		
Total Plant		$12,901,125 40	
Bank and Cash Balance	$422,350 12		
Inventories	561,873 08		
Accounts Receivable	615,226 76		
Sinking Fund	625,217 03		
Other Assets	123,410 97		
Total Liquid Assets		$2,348,077 96	
Total Assets			$15,249,203 36
Liabilities:			
Debenture Balance	$10,678,078 36		
Accounts Payable	1,682,150 29		
Bank Overdraft	228,622 50		
Other Liabilities	113,838 66		
Total Liabilities		$12,702,689 81	
Reserves:			
Debentures Paid	$320,129 10		
Sinking Fund Reserve	625,217 03		
Depreciation Reserve	850,618 07		
Surplus	750,549 35		
Total Reserves		$2,546,513 55	
Total Liabilities and Reserves			$15,249,203 36

The operation of the municipalities consolidated into one report shows the following results:

	Dec 31st, 1912.	Dec. 31st, 1913.	Dec. 31st, 1914.
Number of Municipalities included in report	28	45	69
Operating and maintenance expense	$1,086,135 00	$1,516,613 32	$2,012,754 07
Debenture charges and interest	291,033 00	525,054 44	661,949 23
Total Annual Expense	$1,377,168 00	$2,041,667 76	$2,674,703 30
Total Revenue	1,617,674 00	2,617,439 51	3,433,936 16
Surplus for year	$240,506 00	$575,771 75	$759,232 86
Depreciation Charge	124,992 47	262,675 21	357,883 31
Surplus less Depreciation Charge	$159,219 06	$313,096 54	$401,349 55
Total Assets	$6,349,711 00	$11,977,175 85	$15,249,203 36
Net Debenture Balance and other debt ..	5,822,156 00	10,468,351 78	12,702,689 81
Percentage of Net Debt to Total Assets....	92.5%	87.2%	83.0%
Total plant value	....	$9,196,483 00	$12,901,125 40
Accumulated surplus invested in plant extension	$284,211 53	$859,983 28	$1,601,167 42
Accumulated depreciation reserve	240,229 29	502,904 48	850,618 07
Surplus from operation	$43,982 26	$357,078 80	$750,549 35
Estimated saving to light users only during year	....	1,576,500 00	1,694,300 00
Number of consumers, light	33,568	63,157	93,179
" " " power	1,399	2,532	3,565
Total number of consumers	34,967	65,689	96,744

	Dom. Lt.	Com'l. Lt.
Highest cost per kw-hr. in 1914	10.9	9.4
Lowest " " "	3.7	1.8
Average " " "	4.8	3.9
" " " prior to Hydro	9.4	9.5

The outstanding features of this report are that while the municipalities have invested in distributing plants to the extent of $15,249,203.36, carrying annual fixed charges for interest and sinking fund of $661,949.23, the surplus from operation in 63 municipalities for periods of from one month to three years amount to $1,601,167.42 in addition to the reduction in debenture debt due to sinking fund and principal payments.

Deducting from this profit a depreciation charge to provide for deferred maintenance due to general decay and obsolescence amounting to $850,618.07 there is still a surplus of $750,549.35, or over ten per cent. of the total revenue of the three years. In other words, the total revenue has been over ten per cent. greater than the cost of the service, including depreciation, although the selling rates in most municipalities have been reduced from time to time.

These statements show not only the status of the utility in each municipality, but of all the municipalities in the Niagara, Severn, Wasdell's Falls, St. Lawrence, Ottawa and Port Arthur systems consolidated into one unit.

The result is of particular interest and value, as it is the final answer of the municipalities to their experiment in the co-operative transmission and municipal distribution of Hydro power:—

STATE

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Toronto		Hamilton	
Population	445,575		100,808	
—	1913	1914	1913	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	320,492 71	363,945 40	30,677 72	58,738 46
Sub-Station Equipment	599,258 17	740,980 33	18,172 86	80,956 00
Distribution System, Overhead	1,059,994 96	1,184,748 21	224,981 25	268,751 26
" " Underground	547,540 78	603,500 90	25,808,65	126,692 41
Line Transformers	260,317 73	328,203 35	54.663 41	65,791 02
Meters	372,030 86	490,590 08	73,100 14	104,274 72
Street Light Equipment, Regular	643,944 32	677,878 41	31,512 39	89,943 14
" " Ornamental	....	....	....	67,489 03
Miscel. Equip. and Construction Exp.	639,134 71	737,276 56	76,636 36	116,390 57
Steam or Hydraulic Plant	933,068 06	951,765 56	....	....
Old Plant	106,456 69	104,486 15	2,000 00	2,000 00
Total Plant	5,482,338 99	6,183,374 95	537,552 78	981,026 61
Bank and Cash Balance	257,998 78	263,840 21	....	....
Inventories	231,511 51	409,177 65	40,991 63	33,685 18
Accounts Receivable	351,748 12	379,768 60	28,063 12	51,137 23
Sinking Fund	274,040 00	369,219 16	18,531 87	28,369 94
Other Assets	73,850 58	76,364 37	....	1,318 58
Total Assets	6,671,487 98	7,681,744 94	625,139 40	1,095,537 54
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	4,950,000 00	5,650,000 00	505,000 00	840,000 00
Accounts Payable	1,295,417 41	1,162,358 98	31,039 24	77,066 26
Bank Overdraft	....	....	54,421 14	73,508 89
Other Liabilities	12,121 01	85,143 50	5,621 27	18,093 94
Total Liabilities	6,257,538 42	6,897,502 48	596,081 65	1,008,669 09
Reserves				
Debentures Paid	....	....	....	....
Sinking Fund Reserve	274,040 00	369,219 16	18,531 87	28,359 94
Depreciation Reserve	115,236 80	252,248 48	9,031 35	30,085 01
Surplus	24,672 76	162,774 82	1,494 53	28,413 50
Total Liabilities and Reserves	6,671,487 98	7.681,744 94	625,139 40	1,095,537 54
Percentage of Net Debt to Total Assets	93.8	90.0	94.8	91.8

MENT "A"

of Hydro Municipalities as at December 31st, 1913 and 1914

Ottawa 100,180		London 55,026		Brantford 26,454	Windsor 22,080	Peterboro' 20,150
1913	1914	1913	1914	1914	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
69,958 53	83,081 13	34,784 12	66,912 37	6,546 22	8,397 66	....
75,277 83	100,341 34	75,742 82	124,036 63	12,048 42	9,922 45	....
234,128 27	293,583 97	229,253 51	253,981 24	98,680 18	39,081 31	364 94
70,812 38	70,254 11	352 43	352 43	....	....	....
72,016 15	79,889 90	24,594 84	29,823 63	14,396 85	8,964 30	847 26
76,947 05	92,352 76	77,857 33	98,581 61	15,209 76	4,842 11	1,924 37
52,081 44	52,598 02	34,661 57	35,664 34	15,167 68	7,458 57	5 04
29,847 11	29,957 84	....	....	36,410 50	67,661 39	27,015 99
22,053 88	24,695 29	38,046 18	44,878 01	17,569 90	31,352 18	5,049 16
....	....	....	....	....	....	....
5,000 00	5,097 37	....	....	....	....	100,000 00
708,122 64	831,851 73	515,292 80	654,230 26	216,029 51	177,679 97	135,206 76
102,134 14	30,443 65	11,413 65	8,285 53	55 78	17,187 01	2,879 81
5,233 72	7,421 55	28,479 87	28,124 06	709 27	3,739 81	....
35,000 00	20,000 00	46,996 49	40,611 55	1,756 78	2,047 85	5,817 23
66,619 57	83,026 78	12,791 47	20,932 37	3,862 00	....	2,139 61
....	....	....	....	....	507 13	3 49
917,110 07	972,743 71	614,974 28	752,183 77	222,413 34	201,161 77	146,046 90
650,000 00	650,000 00	460,934 75	456,026 44	152,500 00	201,161 77	120,000 00
18,397 10	3,324 20	65,164 91	127,639 90	....	....	11,905 40
....	....	....	....	57,877 24	....	7,015 99
....	....	1,409 50	864 00	....	....	4 98
668,397 10	653,324 20	527,509 16	584,530 34	210,377 24	201,161 77	138,926 37
....	....	20,965 25	25,873 56	....	....	....
66,619 57	83,026 78	12,791 47	20,932 37	3,862 00	....	2,139 61
156,728 30	189,378 30	38,980 13	66,568 52	6,000 00	....	....
25,365 10	47,014 43	14,728 27	54,278 98	2,174 10	....	4,980 92
917,110 07	972,743 71	614,974 28	752,183 77	222,413 34	201,161 77	146,046 90
72.9	67.2	85.8	77.7	93.8	100.0	95.1

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality / Population	Berlin 18,338		Port Arthur 18,025	
—	1913	1914	1913	1914
	$ c.	$ c.	$ c.	$ c.
ASSETS				
Lands and Buildings	21,344 64	29,512 86	....	....
Sub-Station Equipment	54,847 73	53,952 83	219 89	19,857 44
Distribution System, Overhead	69,688 70	78,373 58	118,326 45	194,657 61
" " Underground	....	6,353 68	....	....
Line Transformers	24,281 17	26,593 35	5,644 05	10,177 83
Meters	25,495 55	33,361 91	14,869 90	41,521 38
Street Light Equipment, Regular	18,004 26	19,532 87	21,639 51	27,000 00
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Ex	5,953 74	6,229 29	3,770 05	8,367 20
Steam or Hydraulic Plant	....	....	381,432 72	357,210 24
Old Plant	58,590 80	56,873 81	....	....
Total Plant	278,206 59	320,784 18	545,902 57	658,791 70
Bank and Cash Balance	3,767 13	15,474 46	....	....
Inventories	4,447 31	4,632 36	....	172 73
Accounts Receivable	6,584 65	11,219 74	....	19,325 03
Sinking Fund	....	....	....	23,390 23
Other Assets	40,893 63	6,867 25	....	148 00
Total Assets	333,899 31	358,977 99	....	701,827 69
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	257,659 13	250,817 14	478,553 57	533,068 30
Accounts Payable	8,384 27	9,332 53	....	9,773 73
Bank Overdraft	....	....	....	3,314 93
Other Liabilities	....	....	....	6,956 46
Total Liabilities	266,043 40	260,149 67	....	553,113 42
Reserves				
Debentures Paid	42,490 87	49,332 86	....	48,431 70
Sinking Fund Reserve	....	....	....	23,390 23
Depreciation Reserve	10,980 79	23,864 84	....	16,469 79
Surplus	14,384 25	25,630 62	....	60,422 55
Total Liabilities and Reserves	333,899 31	358,977 99	....	701,827 69
Percentage of Net Debt to Total Assets	79.7	72.5	87.7	78.8

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

St. Thomas 16,794		Stratford 16,425		Guelph 16,319		St. Catharines 16,186
1913	1914	1913	1914	1913	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
9.676 56	9,709 11	16,837 50	16,950 60	17,346 11	19,298 41	1,147 42
28,426 76	33,857 96	20,779 41	21,213 33	39,598 02	40,360 20	3,531 72
56.575 75	62,139 41	74.403 84	81,559 81	45,407 80	50,822 17	49,752 84
....	....	....	....	....	....	....
11,076 90	12,116 30	12,897 73	14,441 43	6,355 98	8,255 04	8,364 86
14,930 85	21,617 04	13,526 22	19,347 05	15,977 58	19,478 59	8,546 05
11,553 31	11,797 57	5,971 43	5,971 43	22,254 45	22,852 99	2,584 82
....	....	....	1,976 04	....	....	....
3,229 05	5,622 48	7,828 37	7,848 12	6,513 12	6,655 21	8,689 91
....	....	....	....	a 35,734 76	a 36,145 41	....
7,794 75	5,213 84	11,187 00	11,187 00	....	....	30,008 75
143,263 93	162,073 71	163,431 50	180,494 81	189,187 82	208,868 02	112,626 37
21,967 29	9,466 39	350 12	7,502 30	3,178 10	14,308 61	25 00
....	794 80	1,537 94	886 78	11,938 78	11,952 32	4,436 30
10,924 35	8,991 16	6,933 63	2,982 86	8,770 52	9,764 63	1,349 57
....	....	6,806 17	10,091 12	....	12,993 99	2,068 29
....	17,420 42	263 82	2,083 82	396 50	....	....
176,155 57	198,736 48	179.323 18	204,041 69	213,471 72	252,887 57	120,505 53
94,039 74	90,833 51	128,470 00	144,090 00	119,084 02	127,417 09	....
5,958 17	8,117 82	11,662 22	2,775 18	3,272 91	4,465 55	116,521 26
....	....	430 00	....	....	....	....
....	....	....	....	....	....	....
99,997 91	98,951 33	140,562 22	146,865 18	122.356 93	131,882 64	116,521 26
16,960 26	20,166 49	15,330 00	19,710 00	25,865 97	17,582 90	....
....	....	6,806 17	10,091 12	....	12,993 99	2,068 29
15,818 44	47,927 04	12,493 42	17,124 92	37,846 12	48,046 12	850 00
43,378 96	31,691 62	4,131 37	10,250 47	27,402 70	42,381 92	1,065 98
176,155 57	198,736 48	179.323 18	204,041 69	213,471 72	252,887 57	120,505 53
56.8	49.8	78.2	72.0	57.3	52.1	96.7

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Galt		Woodstock	
Population	11,932		10,154	
——	1913	1914	1913	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	10,230 85	11,722 68	7,331 95	7,331 95
Sub-Station Equipment	15,145 48	20,513 66	26,870 13	27,685 13
Distribution System, Overhead	77,483 93	91,467 50	28,907 57	34,334 28
" " Underground	....	....	....	....
Line Transformers	14,831 91	16,296 09	15,638 52	18,253 32
Meters	16,826 68	24,437 73	12,009 27	15,392 17
Street Light Equipment, Regular	7,694 03	7,982 73	10,047 72	10,233 97
" " Ornamental	32,918 23	39,875 76	....	....
Miscel. Equip. and Construction Exp.	5,993 11	8,528 63	....	....
Steam or Hydraulic Plant	....	....	15,743 62	15,743 62
Old Plant	....	....	15,805 26	15,835 26
Total Plant	181,124 22	220,824 78	132,354 04	144,809 70
Bank and Cash Balance	....	....	9,534 36	7,391 38
Inventories	636 35	3,456 49	191 65	705 35
Accounts Receivable	....	....	....	....
Sinking Fund	10,582 92	14,902 70	28,858 51	32,536 50
Other Assets	....	....	....	....
Total Assets	192,343 49	239,183 97	170,938 56	185,442 93
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	136,000 00	136,000 00	107,385 63	107,385 63
Accounts Payable	....	....	....	....
Bank Overdraft	25,667 34	48,762 31	....	....
Other Liabilities	....	....	....	....
Total Liabilities	161,667 34	184,762 31	107,385 63	107,385 63
Reserves				
Debentures Paid	....	....	....	....
Sinking Fund Reserve	10,582 92	14,902 70	28,858 51	32,536 50
Depreciation Reserve	14,900 00	25,500 00	9,442 40	15,892 40
Surplus	5,193 23	14,018 96	25,252 02	29,628 40
Total Liabilities and Reserves	192,343 49	239,183 97	170,938 56	185,442 93
Percentage of Net Debt to Total Assets	84.1	77.2	62.8	57.9

"A"—Continued

of Hydro Municipalities as at December 1913 and 1914

Barrie		Welland		Collingwood		Midland	
7,215		7,208		6,646		6,253	
1913	1914	1913	1914	1913	1914	1913	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
12,034 61	12,034 61	5,156 40	6,172 68	4,343 60	4,343 60	4,780 69	4,780 69
20,535 59	20,536 29	8,017 13	8,981 25	42 80	4,352 80	8,407 78	8,407 78
16,107 32	18,420 33	35,569 34	40,830 86	23,438 67	23,881 01	28,904 82	30,697 06
....	....	....	....	....	....	....	....
3,032 71	3,238 49	9,517 57	11,191 63	4,697 25	4,814 05	6,661 19	7,573 63
13,400 87	14,119 96	5,264 74	8,246 18	7,524 05	8,292 84	9,416 34	10,495 06
1,823 96	3,179 97	1,764 27	1,974 99	2,400 03	2,404 29	3,421 85	3,421 85
....	....	....	....	....	....	....	....
757 49	757 49	5,655 38	6,492 54	4,631 89	5.043 39	3,500 58	3,500 58
31,212 48	31,062 48	....	....	....	....	....	....
....	....	....	....	5,455 75	5,127 75	7,382 84	7,057 84
98,905 03	103,349 62	70,944 83	83,890 13	52,534 04	58,259 73	72,476 09	75,934 49
3,751 54	3,721 03	131 28	535 18	5,821 88	882 84	6,707 06	7,439 46
2,877 83	3,441 72	979 11	720 12	939 68	429 65	90 06	147 23
4,124 88	5,426 07	209 49	2,535 18	1,918 23	6,906 21	....	2,500 93
....	....	....	1,961 30	....	....	....	....
....	....	1,668 73	....	....	....	....	....
109,659 28	115,938 44	73,933 44	89,641 91	61,213 83	66,478 43	79,273 21	86,022 11
55,755 06	52,170 97	....	65,000 00	37,950 42	35,362 35	42,997 23	40,788 82
978 70	1,260 94	71,301 37	22,232 78	5,431 47	4,165 85	578 64	600 00
....	....	704 72	....	....	....	....	....
....	4 22	1,927 35	....	4 64	....	....	....
56,733 76	53,436 13	73,933 44	87,232 78	43,386 53	39,528 20	43,575 87	41,388 82
31,244 94	34,829 03	....	....	1,459 87	4,047 94	10,752 77	12,961 18
....	....	....	1,961 30	....	....	....	....
3,350 00	6,850 00	....	....	2,390 00	4,790 00	5,800 00	9,000 00
18,330 58	20,823 28	....	447 83	13,977 43	18,112 29	19,144 57	22,672 11
109,659 28	115,938 44	73,933 44	89,641 91	61,213 83	66,478 43	79,273 21	86,022 11
51.9	46.1	100.	97.3	70.9	59.5	55.	48.1

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Ingersoll		Preston	
Population	5,149		4,923	
—	1913	1914	1913	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	3,057 57	3,057 57	....	....
Sub-Station Equipment	10,232 56	10,232 56	12,076 92	13,556 37
Distribution System, Overhead	28,350 21	30,046 34	27,687 13	32,190 73
" " Underground	....	....	....	....
Line Transformers	6,288 62	7,734 50	11,345 64	11,539 00
Meters	7,039 66	9,952 66	8,890 62	9,939 77
Street Light Equipment, Regular	2,273 84	2,336 01	1,903 86	1,909 53
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	8,253 30	8,253 30	4,708 43	4,910 22
Steam or Hydraulic Plant	....	....	....	....
Old Plant	22,368 53	22,368 53	24,007 28	23,549 22
Total Plant	87,864 29	93,981 47	90,619 88	97,594 84
Bank and Cash Balance	....	....	....	....
Inventories	805 63	1,305 44	....	1,330 03
Accounts Receivable	10,358 54	5,881 07	6,435 01	5,938 37
Sinking Fund	4,664 10	6,498 21	....	....
Other Assets	....	....	....	....
Total Assets	103,692 56	107,666 19	97,054 89	104,863 24
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	79,800 00	79,800 00	55,986 64	71,055 09
Accounts Payable	945 62	985 50	1,626 88	1,791 90
Bank Overdraft	10,909 10	5,452 88	150 47	5,890 54
Other Liabilities	....	....	21,170 65	....
Total Liabilities	91,654 72	86,238 38	78,934 64	78,737 53
Reserves				
Debentures Paid	....	....	3,878 87	6,810 42
Sinking Fund Reserve	4,664 10	6,498 21	....	....
Depreciation Reserve	2,862 00	6,030 00	6,348 34	9,748 34
Surplus	4,511 74	8,899 60	7,893 04	9,566 95
Total Liabilities and Reserves	103,692 56	107,666 19	97,054 89	104,863 24
Percentage of Net Debt to Total Assets	88.4	80.1	81.3	75.1

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Dundas		Goderich		Waterloo		Walkerville	Paris
4,866		4,811		4,737		4,721	4,216
1913	1914	1913	1914	1913	1914	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	137 92	12,660 04	12,874 90	4,646 71	4,683 07	14,291 69	626 26
2,060 66	2,174 12	....	5,067 27	11,600 73	17,955 85	6,567 50	10,639 96
32,550 60	36,245 57	21,194 25	23,277 27	29,977 46	33,814 17	4,945 46	21,663 21
....	....	....	....	....	....	....	....
5,436 92	6,338 53	4,769 29	6,281 16	6,766 62	7,033 53	349 41	4,142 52
5,476 70	6,971 99	9,340 67	10,292 45	6,030 43	8,342 63	2,814 80	5,071 02
502 81	1,708 19	4,376 73	4,442 79	4,095 19	5,133 01	29,538 36	2,112 05
....	....	....	....	....	....	....	....
3,522 21	5,509 47	1,284 53	1,967 26	1,389 00	1,181 50	8,084 38	210 04
....	....	....	....	2,483 64	2,483 64	....	....
....	2,110 38	10,005 00	10,005 00	10,131 25	10,082 50	32,851 14	50,424 72
49,549 90	61,196 17	63,630 51	74,208 10	77,121 03	90,709 90	99,442 74	94,889 78
....	....	3,318 63	1,386 34	....	....	50 00	1,797 92
3,467 33	1,159 87	530 00	393 79	971 59	1,068 69	24,027 57	98 25
....	1,855 86	565 28	1,463 38	2,454 88	3,342 01	....	....
....	....	2,535 60	2,651 50	1,152 00	1,440 00	....	1,946 17
....	....	4,675 44	....	164 19	2,203 90	3,728 50	210 45
53,017 23	64,211 90	75,255 46	80,103 11	81,863 69	98,764 50	127,248 81	98,942 57
19,629 72	51,728 16	56,088 05	54,542 69	54,659 14	63,943 13	57,304 04	64,919 92
....	....	....	13	945 70	841 87	65,835 40	4,996 40
28,425 90	3,316 39	....	....	3,360 60	1,182 27	1,455 13	....
....	....	158 39	....	....	....	649 13	....
48,055 62	55,044 55	56,246 44	54,542 82	58,965 44	65,967 27	125,243 70	69,916 32
370 28	1,271 84	....	1,545 36	1,340 86	2,056 87	954 96	27,080 08
....	....	2,535 60	2,651 50	1,152 00	1,440 00	....	1,946 17
1,508 00	4,183 00	....	2,920 00	7,950 00	11,450 00	....	....
3,083 33	3,712 51	16,473 42	18,443 43	12,455 39	17,850 36	1,050 15	....
53,017 23	64,211 90	75,255 46	80,103 11	81,863 69	98,764 50	127,248 81	98,942 57
90.6	85.7	74.7	68.1	72.0	66.8	98.4	73.7

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Penetanguishene		St. Mary's	
Population	3,963		3,783	
—	1913	1914	1913	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	2,151 00	2,151 00	13,674 27	13,674 27
Sub-Station Equipment	3,507 71	3,507 71	12,909 54	12,914 54
Distribution System, Overhead	22,801 32	23,287 26	17,621 88	18,883 72
" " Underground	....	....	....	....
Line Transformers	3,343 58	3,524 17	9,877 87	9,918 40
Meters	4,400 93	5,026 26	6,582 18	8,720 68
Street Light Equipment, Regular	1,607 91	1,721 40	2,148 40	2,667 79
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	278 93	278 93	1,601,75	1,601 75
Steam or Hydraulic Plant	....	....	....	....
Old Plant	2,940 00	2,939 00	....	....
Total Plant	41,031 38	42,435 73	64,415 89	68,381 15
Bank and Cash Balance	....	....	7,427 19	494 37
Inventories	411 43	834 46	429 95	716 75
Accounts Receivable	....	2,650 00	1,715 00	1,685 00
Sinking Fund	....	....	503 73	1,049 31
Other Assets	....	....	....	8,550 00
Total Assets	41,442 81	45,920 19	74,491 76	80,876 58
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	29,490 67	28,858 61	44,787 30	44,900 97
Accounts Payable	....	....	9,476 77	5,810 72
Bank Overdraft	1,892 14	1,836 36	....	....
Other Liabilities	....	....	....	....
Total Liabilities	31,382 81	30,694 97	54,264 07	50,711 69
Reserves				
Debentures Paid	1,509 33	2,141 39	16,170 42	18,346 05
Sinking Fund Reserve	....	....	503 73	1,049 31
Depreciation Reserve	3,485 00	5,445 00	....	3,340 00
Surplus	5,065 67	7,638 83	3,553 54	7,429 53
Total Liabilities and Reserves	41,442 81	45,920 19	74,491 76	80,876 58
Percentage of Net Debt to Total Assets	75.7	66.8	72.8	62.7

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Brampton		Tillsonburg		Hespeler		Prescott
3,344		3,155		3,086		2,877
1913	1914	1913	1914	1913	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
3,808 08	3,808 08	1,896 47	1,974 27	3,499 23	3,499 23	2,743 35
5,181 32	5,183 67	6,818 47	6,818 47	8,500 83	8,506 64	....
30,628 36	31,669 90	17,522 44	17,736 20	5,702 58	6,244 06	22,956 43
....	....	....	....	....	....	....
8,779 81	9,323 69	4,041 90	4,041 90	4,025 26	3,971 30	5,028 36
7,998 00	8,580 90	3,613 36	4,294 27	3,594 78	4,111 93	7,151 98
1,714 47	1,785 82	1,762 50	1,762 50	718 95	753 50	1,218 43
....	....	....	....	....	....	....
2,895 62	2,895 62	918 83	918 83	93 08	93 08	731 22
....	....	....	....	....	....	12,108 35
15,000 00	15,000 00	....	....	3,000 00	3,000 00	....
76,005 66	78,247 68	36,573 97	37,546 44	29,134 71	30,179 74	51,938 12
....	1,529 90	414 95	2,383 67	....	1,113 29	247 58
372 34	459 64	234 43	978 42	....	....	....
....	....	3,668 22	3,349 04	529 90	549 71	603 29
....	....	....	....	....	....	....
....	....	1,000 00	....	2,905 90	2,594 35	....
76,378 00	80,237 22	41,891 57	44,257 57	32,570 51	34,437 09	52,788 99
66,593 77	64,896 56	34,971 49	33,907 07	18,108 30	28,452 44	14,008 13
....	....	1,600 00	600 00	....	516 58	5,711 54
1,200 08	....	....	....	12,000 00	....	....
....	....	....	....	....	....	280 00
67,793 85	64,896 56	36,571 49	34,507 07	30,108 30	28,969 02	19,999 67
2,456 87	4,154 08	1,028 51	2,092 93	2,462 21	4,118 07	771 21
....	....	....	....	....	....	....
5,200 00	8,200 00	2,606 50	4,436 50	....	1,350 00	1,950 00
927 28	2,986 58	1,685 07	3,221 07	....	....	30,068 11
76,378 00	80,237 22	41,891 57	44,257 57	32,570 51	34,437 09	52,788 99
88.8	80.9	87.3	78.0	92.1	84.0	37.9

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Weston		Elmira	Clinton
Population	2,307		2,134	2,112
—	1913	1914	1914	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	3,230 94	3,230 94	....	....
Sub-Station Equipment	4,985 23	4,985 23	....	4,144 87
Distribution System, Overhead	9,723 63	11,349 65	8,793 62	10,302 76
" " Underground	....	....	....	....
Line Transformers	4,158 10	4,334 55	2,112 02	1,937 64
Meters	2,779 93	3,221 68	2,214 61	2,649 27
Street Light Equipment, Regular	1,361 12	1,893 15	570 67	206 41
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	2,896 21	2,959 67	2,076 74	3,293 18
Steam or Hydraulic Plant	....	....	....	....
Old Plant	....	....	2,296 27	13,491 00
Total Plant	29,135 16	31,974 87	18,063 93	36,025 13
Bank and Cash Balance	91 86	....	3,542 98	....
Inventories	86 70	152 16	131 83	407 00
Accounts Receivable	632 07	595 33	....	585 46
Sinking Fund	....	....	....	792 40
Other Assets	....	805 13	....	70 37
Total Assets	29,945 79	33,527 49	21,738 74	37,880 36
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	18,626 50	17,945 62	19,747 02	30,000 00
Accounts Payable	543 78	811 38	....	6,530 26
Bank Overdraft	....	172 02	....	557 70
Other Liabilities	....	1,642 76	....	....
Total Liabilities	19,170 28	20,571 78	19,747 02	37,087 96
Reserves				
Debentures Paid	1,341 38	2,022 26	252 98	....
Sinking Fund Reserve	....	....	....	792 40
Depreciation Reserve	2,650 00	4,100 00	650 00	....
Surplus	6,784 13	6,833 45	1,088 74	....
Total Liabilities and Reserves	29,945 79	33,527 49	21,738 74	37,880 36
Percentage of Net Debt to Total Assets	64.0	61.7	90.8	97.9

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Milton 2,053		Georgetown 1,965		Seaforth 1,901		Mimico 1,758	
1913	1914	1913	1914	1913	1914	1913	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	....	12 00	12 00	1,194 00	1,194 00	98 30	98 30
4,940 19	5,550 19	....	....	6,031 75	6,031 75	....	....
8,758 21	9,144 70	9,464 24	11,080 32	13,325 50	14,166 06	10,563 83	14,785 46
....	....	....	....	....	....	....	....
872 43	1,462 85	1,978 76	4,284 36	2,589 49	2,733 80	965 88	1,065 00
2,291 32	2,901 68	2,235 98	2,951 43	2,854 15	3,351 87	2,740 79	3,956 64
935 43	935 43	903 94	903 94	797 34	797 34	543 90	655 46
....	....	....	....	....	....	....	....
2,061 49	2,476 90	669 51	939 53	310 98	355 98	694 38	1,103 49
....	....	....	....	....	....	....	....
4,712 98	4,712 98	2,750 05	2,209 80	....	....	....	....
24,572 05	27,184 73	18,014 48	22,381 38	27,103 21	28,630 80	15,607 08	21,664 35
292 64	1,927 78	2,951 30	1,750 51	745 65	962 98	398 13	271 50
873 84	813 65	341 66	478 75	1,005 18	1,453 45	375 37	323 01
2,518 99	4,007 26	....	82 50	99 81	46 34	82 05	161 82
....	....	....	....	909 33	1,391 45	....	....
396 01	....	....	....	....	....	....	....
28,653 53	33,933 42	21,307 44	24,693 14	29,863 18	32,485 02	16,462 63	22,420 68
23,713 76	22,510 00	20,000 00	19,747 02	21,000 00	25,000 00	14,685 80	14,322 69
798 00	....	....	....	4,000 00	....	211 25	4,251 38
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
24,511 76	22,510 00	20,000 00	19,747 02	25,000 00	25,000 00	14,897 05	18,574 07
999 22	2,202 98	....	252 98	....	....	3 4 20	677 31
....	....	....	....	909 33	1,391 45	....	....
900 00	2,150 00	300 00	1,150 00	1,300 00	2,700 00	740 00	1,660 00
2,242 55	7,070 44	1,007 44	3,543 14	2,653 85	3,393 57	511 38	1,509 30
28,653 53	33,933 42	21,307 44	24,693 14	29,863 18	32,485 02	16,462 63	22,420 68
85.5	66.0	93.9	80.0	83.7	77.0	90.5	82.8

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality / Population	Mitchell 1,746		New Hamburg 1,735	
—	1913	1914	1913	1914
	$ c.	$ c.	$ c.	$ c.
ASSETS				
Lands and Buildings	4,217 24	4,550 44	2,257 59	2,257 59
Sub-Station Equipment	9,034 86	9,034 86	1,054 90	1,083 10
Distribution System, Overhead	5,981 19	6,756 16	7,865 33	8,039 43
" " Underground	....	....	....	....
Line Transformers	823 82	883 82	2,664 75	2,664 75
Meters	1,518 97	2,193 62	2,578 62	2,830 27
Street Light Equipment, Regular	461 41	823 16	1,077 93	1,077 93
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp	....	....	903 53	958 48
Steam or Hydraulic Plant	1,500 00	1,500 00	....	....
Old Plant	....	....	5,324 56	5,324 56
Total Plant	23,537 49	25,742 06	23,727 21	24,236 11
Bank and Cash Balance	....	324 77	....	....
Inventories	343 59	531 39	3,175 87	4,300 42
Accounts Receivable	1,650 64	1,560 00	1,159 92	1,140 54
Sinking Fund	....	....	....	....
Other Assets	....	....	....	....
Total Assets	25,531 72	28,158 22	28,063 00	29,677 07
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	11,684 02	10,094 81	17,151 94	16,838 31
Accounts Payable	....	359 21	462 00	288 00
Bank Overdraft	732 17	....	3,234 39	2,228 53
Other Liabilities	....	....	....	....
Total Liabilities	12,416 19	10,454 02	20,848 33	19,354 84
Reserves				
Debentures Paid	3,167 76	4,756 97	577 14	890 77
Sinking Fund Reserve	....	....	....	....
Depreciation Reserve	2,177 21	3,377 21	2,045 00	2,945 00
Surplus	7,770 56	9,570 02	4,592 53	6,486 46
Total Liabilities and Reserves	25,531 72	28,158 22	28,063 00	29,677 07
Percentage of Net Debt to Total Assets	48.7	37.1	74.3	65.2

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Acton		Fergus	Norwich		Elora	Pt. Dalhousie	
1,634		1,587	1,185		1,225	1,281	
1913	1914	1914	1913	1914	1914	1913	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1,500 00	1,500 00	...	655 00	829 17	...	...	...
597 62	597 62	...	...	...	...	...	...
4,515 62	4,763 72	7,469 45	6,373 65	6,373 65	6,138 53	2,191 89	3,023 09
...	...	...	...	...	...	...	...
1,310 00	1,535 50	486 65	828 37	828 37	803 21	1,732 75	1,732 75
1,347 00	1,893 40	1,742 13	1,717 47	2,004 51	1,068 18	185 71	185 71
886 81	892 61	809 10	520 56	546 06	438 33	220 95	220 95
...	...	...	...	...	...	...	...
777 99	777 99	400 71	680 54	680 54	839 00	386 66	386 66
...	...	...	...	...	...	...	...
3,550 00	3,550 00	2,863 00	3,509 82	3,509 82	2,100 00	6,325 50	6,325 50
14,485 05	15,510 84	13,771 04	14,285 41	14,772 12	11,387 25	11,043 46	11,874 66
653 05	457 02	131 94	...	471 76	10 34	72 58	703 77
187 00	75 00	1,734 01	716 13	993 00	342 12	145 50	33 10
...	130 00	...	1,557 53	1,706 42	...	1,246 67	...
3,752 00	3,954 00	...	...	...	...	...	...
...	...	545 21	...	...	...	...	...
19,077 10	20,126 86	16,182 20	16,559 07	17,946 30	11,739 71	12,508 21	12,611 53
14,500 00	14,242 94	16,000 00	13,422 51	13,198 79	9,790 48	...	...
...	...	...	1,044 85	518 09	1,709 52	...	...
...	...	...	132 12	...	...	11,957 44	11,646 74
...	...	182 20	...	...	...	...	...
14,500 00	14,242 94	16,182 20	14,599 48	13,716 88	11,500 00	11,957 44	11,646 74
...	257 06	...	333 49	557 21	209 52	...	...
3,752 00	3,954 00	...	...	...	...	...	...
500 00	1,000 00	...	500 00	1,030 00	...	450 00	864 02
325 10	672 86	...	1,126 10	2,642 21	30 19	100 77	100 77
19,077 10	20,126 86	16,182 20	16,559 07	17,946 30	11,739 71	12,508 21	12,611 53
76.0	70.7	100	88.2	76.4	97.1	95.6	92.5

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Caledonia		Winchester	Stayner
Population	1,175		1,099	1,033
—	1913	1914	1914	1913
Assets	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	....	....	200 00	....
Sub-Station Equipment	....	....	....	....
Distribution System, Overhead	3,572 32	4,283 96	7,001 51	1,211 03
" " Underground	....	....	....	....
Line Transformers	318 00	318 00	481 86	300 00
Meters	378 57	673 22	997 19	635 78
Street Light Equipment, Regular	161 65	282 27	564 98	86 31
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	424 62	473 20	521 22	128 40
Steam or Hydraulic Plant	....	....	....	....
Old Plant	....	....	1,100 00	7,657 15
Total Plant	4,855 16	6,030 65	10,866 76	10,018 67
Bank and Cash Balance	127 82	11 61	....	866 87
Inventories	....	....	583 44	33 75
Accounts Receivable	....	189 00	....	336 86
Sinking Fund	....	....	....	....
Other Assets	....	....	....	....
Total Assets	4,982 98	6,231 26	11,450 20	11,256 15
Liabilities and Reserves				
Liabilities				
Debenture Balance	....	4,624 00	....	8,755 34
Accounts Payable	4,496 54	259 17	9,580 89	2,186 72
Bank Overdraft	....	....	....	....
Other Liabilities	....	....	....	....
Total Liabilities	4,496 54	4,883 17	9,580 89	10,942 06
Reserves				
Debentures Paid	....	....	....	244 66
Sinking Fund Reserve	....	....	....	....
Depreciation Reserve	250 00	510 00	500 00	....
Surplus	236 44	838 09	1,369 31	69 43
Total Liabilities and Reserves	4,982 98	6,231 26	11,450 20	11,256 15
Percentage of Net Debt to Total Assets	90.2	78.4	83.7	97.2

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Stayner	Beaverton	New Toronto	Hagersville		Port Credit	
1,033	1,015	985	977		944	
1914	1914	1914	1913	1914	1913	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	250 00	....	....	....	675 00	675 00
....	....	....	....	....	....	....
1,301 96	4,513 16	4,623 04	5,177 94	6,240 31	6,428 27	7,332 36
....	....	....	....	....	....	....
300 00	193 24	663 19	264 30	558 77	439 12	747 98
635 78	70 95	1,080 60	400 11	1,157 05	1,126 28	1,652 18
86 31	399 83	271 18	359 56	415 55	254 09	294 99
....	....	....	....	....	....	....
128 40	418 32	1,125 40	346 40	96 19	610 26	614 26
....	....	....	....	....	....	....
7,657 15	4,000 00	....	....	....	....	....
10,109 60	9,845 50	7,763 41	6,548 31	8,467 87	9,533 02	11,316 77
....	683 07	....	....	131 65	609 80	....
34 38	264 76	37 80	....	486 55	18 46	....
871 94	....	600 00	....	....	371 06	180 00
....	....	....	....	....	....	....
....	....	....	....	....	....	....
11,015 92	10,793 33	8,401 21	6,548 31	9,086 07	10,532 34	11,496 77
8,496 00	10,000 00	7,879 58	6,000 00	7,909 69	7,268 56	7,144 09
1,005 07	793 33	....	357 81	....	1,300 83	1,300 48
572 29	....	65 98	164 25	....	208 10	61 94
....	....	....	....	....	....	....
10,073 36	10,793 33	7,945 56	6,522 06	7,909 69	8,777 49	8,506 51
504 00	....	120 42	....	90 31	231 44	355 91
....	....	....	....	....	....	....
115 00	....	200 00	....	425 00	446 00	981 00
323 56	....	135 23	26 25	661 07	1,077 41	1,653 35
11,015 92	10,793 33	8,401 21	6,548 31	9,086 07	10,532 34	11,496 77
91.4	100	94.6	99.6	87.0	83.3	74.0

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Cannington	Port Stanley		Chesterville
Population	934	849		831
—	1914	1913	1914	1914
ASSETS	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	....	1,195 99	1,505 38	....
Sub-Station Equipment	....	....	....	....
Distribution System, Overhead	4,739 60	8,635 69	8,861 69	4,098 65
" " Underground	....	....	....	....
Line Transformers	276 00	1,169 56	1,256 56	174 78
Meters	315 69	1,553 58	1,736 26	236 80
Street Light Equipment, Regular	349 38	570 60	570 60	160 34
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	....	5,517 16	5,517 16	479 12
Steam or Hydraulic Plant	....	....	....	....
Old Plant	3,729 37	1,000 00	1,000 00	....
Total Plant	9,410 04	19,642 58	20,447 65	5,149 69
Bank and Cash Balance	2,909 90	2,584 50	4,029 25	696 36
Inventories	....	....	....	....
Accounts Receivable	....	....	....	50 00
Sinking Fund	....	....	....	....
Other Assets	....	....	....	....
Total Assets	12,319 94	22,227 08	24,476 90	5,896 05
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	12,000 00	18,153 58	17,828 48	4,931 00
Accounts Payable	319 94	....	40 00	602 44
Bank Overdraft	....	....	....	....
Other Liabilities	....	....	....	17 47
Total Liabilities	12,319 94	18,153 58	17,868 48	5,550 91
Reserves				
Debentures Paid	....	796 42	1,121 52	69 00
Sinking Fund Reserve	....	....	....	....
Depreciation Reserve	....	1,388 08	2,338 08	247 50
Surplus	....	1,889 00	3,148 82	28 64
Total Liabilities and Reserves	12,319 94	22,227 08	24,476 90	5,896 05
Percentage of Net Debt to Total Assets	100	81.7	72.1	94.1

"A"—Continued

of Hydro Municipalities as at December 31st, 1913 and 1914

Waterdown 805		Elmvale 775		Baden 710		Streetsville 694
1913	1914	1913	1914	1913	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	....	106 25	106 25	660 64	660 64	....
....	....	....	....	....	....	....
5,323 22	6,241 13	5,369 35	5,373 48	3,416 34	3,575 21	5,929 42
....	....	....	....	....	....	....
1,056 10	1,645 24	268 85	432 87	606 38	640 67	....
789 34	1,176 47	773 70	825 05	514 55	670 95	....
116 96	156 65	298 93	298 93	342 72	370 02	....
....	....	....	....	....	....	....
88 34	88 34	455 93	455 93	....	....	....
....	....	....	....	....	....	....
....	....	....	....	....	....	....
7,373 96	9,307 83	7,273 01	7,492 51	5,540 63	5,917 49	5,929 42
274 45	259 05	....	....	330 43	1,265 29	....
....	104 26	....	....	....	6 71	....
....	....	36 00	224 42	....	....	....
....	....	....	....	....	....	....
....	....	94 13	....	....	....	....
7,648 41	9,671 14	7,403 14	7,716 93	5,871 06	7,189 49	5,929 42
6,303 41	6,096 89	6,894 64	6,784 01	4,843 68	4,759 59	5,645 00
....	1,200 41	....	....	115 22	350 00	284 42
....	....	333 39	287 81	....	....	....
....	....	....	....	....	....	....
6,303 41	7,297 30	7,228 03	7,071 82	4,958 90	5,109 59	5,929 42
196 59	403 11	105 36	215 99	156 32	240 41	....
....	....	....	....	....	....	....
365 00	785 00	....	350 00	277 00	557 00	....
783 41	1,185 73	....	79 12	478 84	1,282 49	....
7,648 41	9,671 14	7,403 14	7,716 93	5,871 06	7,189 49	5,929 42
82.4	74.8	97.6	91.6	84.5	71.1	100.0

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Sunderland	Creemore	Beachville	
Population	600	590	501	
—	1914	1914	1913	1914
Assets	$ c.	$ c.	$ c.	$ c.
Lands and Buildings	....	....	161 03	161 03
Sub-Station Equipment	....	....	....	....
Distribution System, Overhead	2,281 98	3,459 73	6,238 17	6,314 43
" " Underground	....	....	....	....
Line Transformers	470 00	315 48	604 85	604 85
Meters	....	570 00	579 83	600 43
Street Light Equipment, Regular	153 02	261 17	237 03	237 03
" " Ornamental	....	....	....	....
Miscel. Equip. and Construction Exp.	21 74	111 89	540 36	540 36
Steam or Hydraulic Plant	....	....	....	....
Old Plant	2,030 00	....	....	....
Total Plant	4,956 74	4,718 27	8,361 27	8,458 13
Bank and Cash Balance	843 26	316 52	2,972 79	275 58
Inventories	....	131 10	50 00	117 45
Accounts Receivable	....	....	1,732 83	1,029 60
Sinking Fund	....	....	....	....
Other Assets	....	....	....	....
Total Assets	5,800 00	5,165 89	13,116 89	9,880 76
Liabilities and Reserves				
Liabilities				
Debenture Balance	5,800 00	4,602 75	5,360 00	5,213 71
Accounts Payable	....	....	6,013 07	477 97
Bank Overdraft	....	348 85	....	....
Other Liabilities	....	....	....	....
Total Liabilities	5,800 00	4,951 60	11,373 07	5,691 68
Reserves				
Debentures Paid	....	....	....	146 29
Sinking Fund Reserve	....	....	....	....
Depreciation Reserve	....	....	525 00	925 00
Surplus	....	214 29	1,218 82	3,117 79
Total Liabilities and Reserves	5,800 00	5,165 89	13,116 89	9,880 76
Percentage of Net Debt to Total Assets	100	95.9	86.7	57.7

"A"—Concluded

of Hydro Municipalities as at December 31st, 1913 and 1914

Woodville 500	Rockwood 650		Coldwater 609		Thamesford 400	Thorndale 257	Toronto Township
1914	1913	1914	1913	1914	1914	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
....	79 00	79 00	275 00	275 00	....	....	....
....	....	....	....	....	....	....	....
966 94	3,533 29	3,743 79	5,179 40	5,278 18	2,812 54	1,738 15	778 22
....	....	....	....	....	....	....	....
27 00	894 50	853 43	797 57	1,010 77	937 05	381 71	....
....	488 13	648 08	972 07	1,060 96	833 21	466 53	....
46 72	254 58	254 58	343 78	354 20	155 62	59 40	....
....	....	....	....	....	....	....	....
31 45	277 01	277 01	132 53	132 53	257 89	148 95	....
....	....	....	....	....	....	....	....
2,250 00	....	....	....	....	....	....	....
3,322 11	5,526 51	5,855 89	7,700 35	8,111 64	4,996 31	2,794 74	778 22
677 89	....	....	....	....	334 68	13 50	905 45
....	56 76	83 31	....	1.195 69	4 25	45 21	....
....	....	....	1,849 84	268 72	....	....	2,339 06
....	....	....	....	....	....	....	....
....	....	....	....	....	....	....	....
4,000 00	5,583 27	5,939 20	9,550 19	9,576 05	5,335 24	2,853 45	4,022 73
4,000 00	2,000 00	1,627 97	7,000 00	6,903 36	3,023 49	2,432 24	....
....	....	....	....	81 66	1,681 81	100 00	974 44
....	3,315 63	2,413 87	1,680 18	653 84	....	....	....
....	....	....	....	....	....	....	....
4,000 00	5,315 63	4,041 84	8,680 18	7,638 86	4,705 30	2,532 24	974 44
....	....	372 03	....	96 64	34 51	....	....
....	....	....	....	....	....	....	....
....	....	275 00	375 00	755 00	250 00	130 00	....
....	267 64	1,250 33	495 01	1,085 55	345 43	191 21	3,048 29
4,000 00	5,583 27	5,939 20	9,550 19	9,576 05	5.335 24	2,853 45	4,022 73
100	95.0	68.1	90.9	79.8	88.0	88.7	....

STATE

Report Showing Operation of Municipalities

Municipality	Months Covered by Report	Population	Plant Cost	Debentures and Construction Overdraft	Operation and Maintenance	Fixed Charges	Total Operation
			$ c.	$ c.	$ c.	$ c.	$ c.
Toronto	12	445,575	6,183,374 95	5,399,132 49	864,692 90	325,551 67	1,190,244 57
Hamilton	12	100,808	981,026 61	922,528 10	139,807 25	46,398 68	186,205 93
Ottawa	12	100,180	831,851 73	566,973 22	122,460 24	38,002 88	160,463 12
London	12	55,026	654,230 26	584,530 34	161,935 49	35,127 20	197,062 69
Brantford	9	26,454	216,029 51	210,377 24	19,878 13	7,444 31	27,322 44
Windsor	4	22,080	177,679 97	177,679 97	7,591 75	666 66	8,258 41
Peterboro	3	20,150	135,206 76	127,015 99	19,499 31	2,026 21	21,525 52
Berlin	12	18,338	320,784 18	250,817 14	61,900 88	18,719 43	80,620 31
Port Arthur	12	18,025	658,791 70	509,678 07	83,566 34	40,489 67	124,056 01
St. Thomas	12	16,794	162,073 71	90,833 51	52,510 69	7,406 14	59,916 83
Stratford	12	16,425	180,494 81	133,998 88	37,735 14	12,989 75	50,724 89
Guelph	12	16,319	203,868 02	114,423 10	46,331 23	10,273 27	56,604 50
St. Catharines	3	16,186	112,626 37	110,710 39	13,136 28	1,105 87	14,242 15
Galt	12	11,932	220,824 78	169,859 61	31,232 85	10,337 35	41,570 20
Woodstock	12	10,154	144,809 70	74,849 13	29,996 27	7,219 04	37,215 31
Barrie	12	7,215	103,349 62	53,436 13	16,992 02	6,052 29	23,044 31
Welland	12	7,208	83,890 13	81,928 83	12,337 19	5,080 20	17,417 39
Collingwood	12	6,646	58,259 73	35,362 35	14,320 97	4,369 96	18,690 93
Midland	12	6,253	75,934 49	40,788 82	11,221 44	4,267 05	15,488 49
Ingersoll	12	5,149	93,981 47	73,301 79	15,719 97	5,198 90	20,918 87
Preston	12	4,923	97,594 84	71,055 09	24,009 06	7,300 84	31,309 90
Dundas	12	4,866	61,196 17	51,728 16	9,239 50	4,361 01	13,600 51
Goderich	12	4,811	74,208 10	51,891 19	9,087 17	4,182 09	13,269 26
Waterloo	12	4,737	90,709 90	62,503 13	16,078 43	3,473 33	19,551 76
Walkerville	5	4,721	99,442 74	98,422 59	9,331 18	1,908 19	11,239 37
Paris	12	4,216	94,889 78	62,973 75	7,427 73	5,849 94	13,277 67
Penetang	12	3,963	42,435 73	28,858 61	10,750 00	1,986 09	12,736 09
St. Mary's	12	3,783	68,381 15	44,900 97	12,704 07	4,658 00	17,362 07
Brampton	12	3,344	78,247 68	64,896 56	15,717 55	4,936 36	20,653 91
Tillsonburg	12	3,155	37,546 44	33,907 07	11,483 80	2,727 41	14,211 21
Hespeler	12	3,086	30,179 74	28,452 44	7,418 55	3,144 33	10,562 88
Prescott	12	2,877	51,938 12	19,719 67	7,452 50	1,722 31	9,174 81
Weston	12	2,307	31,974 87	19,588 38	8,643 36	1,588 42	10,231 78
Elmira	13	2,134	18,063 93	19,747 02	4,381 75	1,425 22	5,806 97
Clinton	9	2,112	36,025 13	35,737 86	4,644 58	1,838 56	6,483 14
Milton	12	2,053	27,184 73	22,510 00	8,964 32	2,277 04	11,241 36
Georgetown	12	1,965	22,381 38	19,747 02	5,399 38	1,466 55	6,865 93
Seaforth	12	1,901	28,630 80	23,608 55	10,891 80	1,704 25	12,596 05
Mimico	12	1,758	21,664 35	18,574 07	3,618 77	1,561 45	5,180 22
Mitchell	12	1,746	25,742 06	10,094 81	6,298 13	2,224 06	8,522 19
New Hamburg	12	1,735	24,236 11	16,838 31	6,253 13	1,172 91	7,426 04
Acton	12	1,634	15,510 84	10,288 94	3,470 81	1,124 06	4,594 87
Fergus	1	1,587	13,771 04	16,000 00	....	....	....
Norwich	12	1,185	14,772 12	13,198 79	3,994 24	960 58	4,954 82
Elora	1	1,225	11,387 25	11,500 00	224 02	125 35	349 37
Pt. Dalhousie	12	1,280	11,874 66	11,646 74	3,825 64	725 89	4,551 53
Caledonia	12	1,175	6,030 65	4,624 00	864 57	122 86	987 43
Winchester	12	1,099	10,866 76	9,580 89	2,060 98	541 80	2,602 78
Stayner	12	1,033	10,109 60	8,496 00	2,910 30	784 66	3,694 96
Beaverton	....	1,015	9,845 50	10,000 00	....	....	....

MENT "B"

for Period ending December 31st, 1914

Revenue	Surplus	Depreciation Charge	Surplus less Depreciation Charge	Number of Consumers				PerCent. of Consumers to Population	H. P. taken in Dec. 1914
				Domestic	Com'l	Power	Total		
$ c.	$ c.	$ c.	$ c.						
1,482,727 06	292,482 49	147,181 40	145,301 09	23,181	6,276	1,494	30,951	a 6.9	28,754
234,178 56	47,972 63	21,053 66	26,918 97	8,404	1,375	337	10,116	a 10.	6,481
202,910 83	42,447 71	32,650 00	9,797 71	6,342	852	156	7,350	a 7.3	3,793
269,851 80	72,789 11	27,588 39	45,200 72	6,299	1,075	275	7,649	a 13.9	5,188
35,496 54	8,174 10	6,000 00	2,174 10	1,184	300	11	1,495	a 5.7	1,011
8,258 41	....	....	....	1,802	257	10	2,069	a 9.4	818
26,506 44	4,980 92	....	4,980 92	2,692	507	93	3,292	16.3	2,620
104,750 73	24,130 42	12,884 05	11,246 37	1,694	519	130	2,343	12.8	2,323
179,294 93	55,238 92	16,469 79	38,769 13	2,969	550	55	3,574	19.8	2,340
82,844 46	22,927 17	7,350 00	15,577 17	1,499	384	92	1,975	11.8	1,575
61,475 49	10,750 60	4,631 50	6,119 10	1,403	396	99	1,898	11.5	1,063
82,099 59	25,495 09	10,200 00	15,295 09	1,573	441	80	2,094	12.8	1,876
16,158 13	1,915 98	850 00	1,065 98	833	92	20	945	a 5.8	1,240
60,995 93	19,425 73	10,600 00	8,825 73	1,745	339	70	2,154	18.0	1,293
48,041 69	10,826 38	6,450 00	4,376 38	949	337	57	1,343	13.2	860
29,037 01	5,992 70	3,500 00	2,492 70	651	200	13	864	12.0	449
19,442 29	2,024 90	....	2,024 90	492	53	23	568	a 7.9	617
25,225 79	6,534 86	2,400 00	4,134 86	554	232	21	807	12.1	346
22,216 03	6,727 54	3,200 00	3,527 54	621	176	32	829	13.2	430
28,474 73	7,555 86	3,168 00	4,387 86	416	194	48	658	12.8	452
36,383 81	5,073 91	3,400 00	1,673 91	629	165	29	823	16.7	837
16,904 69	3,304 18	2,675 00	629 18	520	153	30	703	ab 14.4	395
18,159 27	4,890 01	2,920 00	1,970 01	400	155	10	565	11.7	208
28,446 73	8,894 97	3,500 00	5,394 97	430	153	51	634	13.4	450
12,289 52	1,050 15	....	1,050 15	790	175	75	1,040	22.0	258
13,067 22	f *210 45*	....	....	354	142	1	497	11.8	268
15,019 25	2,283 16	1,960 00	323 16	153	100	15	268	6.8	278
23,399 33	6,037 26	3,340 00	2,697 26	454	161	30	645	17.1	301
25,713 21	5,059 30	3,000 00	2,059 30	627	174	21	822	24.6	476
17,577 44	3,366 23	1,830 00	1,536 23	300	160	16	476	15.1	248
12,164 43	1,601 55	1,350 00	251 55	229	85	13	327	10.6	212
12,077 02	2,902 21	1,950 00	952 21	342	122	10	474	16.5	186
13,367 90	3,136 12	1,450 00	1,686 12	352	78	10	440	19.0	154
7,545 71	1,738 74	650 00	1,088 74	158	65	8	231	10.8	83
6,412 77	f *70 37*	....	....	179	111	7	297	14.0	106
17,319 25	6,077 89	1,250 00	4,827 89	150	79	6	235	11.5	153
10,251 63	3,385 70	850 00	2,535 70	242	95	17	354	17.9	253
14,735 77	2,139 72	1,400 00	739 72	211	112	10	333	17.5	253
7,098 14	1,917 92	920 00	997 92	462	10	5	477	ab 27.1	114
11,521 65	2,999 46	1,200 00	1,799 46	191	100	16	307	17.3	123
10,219 97	2,793 93	900 00	1,893 93	170	68	6	244	14.0	92
5,442 63	847 76	500 00	347 76	146	58	5	209	12.8	75
....	....	....	....	95	80	1	176	11.1	72
7,000 93	2,046 11	530 00	1,516 11	198	84	3	285	b 24.0	84
379 56	30 19	....	30 19	60	55	......	115	9.4	48
4,965 55	414 02	414 02	....	240	10	3	253	19.8	119
1,849 08	861 65	260 00	601 65	21	32	......	53	4.5	31
4,472 09	1,869 31	500 00	1,369 31	103	50	......	153	13.9	53
4,064 09	369 13	115 00	254 13	108	56	2	166	16.1	60
....	....	....	....	100	50	......	150	15.0	67

Note "a"—Competitive territory.
"b"—Includes some rural load.
"d"—Includes summer cottages.
"e"—Approximate figures, subject to final audit.
"f"—Loss.

STATEMENT

Report Showing Operation of Municipalities

Municipality	Months Covered by Report	Population	Plant Cost	Debentures and Construction Overdraft	Operation and Maintenance	Fixed Charges	Total Operation
			$ c.	$ c.	$ c.	$ c.	$ c.
New Toronto.	12	985	7,763 41	7,879 58	739 89	178 44	918 33
Hagersville ..	12	977	8,467 87	7,909 69	3,755 26	383 93	4,139 19
Pt. Credit ...	12	944	11,316 77	8,444 57	1,898 41	571 55	2,469 96
Cannington ..	....	934	9,410 04	12,000 00	....	....	....
Pt. Stanley..	12	849	20,447 65	17,828 48	4,667 37	1,232 82	5,900 19
Chesterville..	12	831	5,149 69	4,931 00	1,166 66	344 00	1,510 66
Waterdown ..	12	805	9,307 83	7,297 30	1,984 39	723 09	2,707 48
Elmvale	12	775	7,492 51	6,784 01	1,673 75	434 67	2,108 42
Baden	12	710	5,917 49	5,109 59	5,124 81	325 26	5,450 07
Streetsville ..	....	694	5,929 42	5,929 42	....	....	....
Sunderland ..	....	600	4,956 74	5,800 00	....	....	....
Creemore	2	590	4,718 27	4,602 75	168 14	20 59	188 73
Beachville ...	12	501	8,458 13	5,691 68	3,584 95	501 45	4,086 40
Woodville....	....	500	3,322 11	4,000 00	....	....	....
Rockwood	12	650	5,855 89	4,041 84	1,269 18	413 19	1,682 37
Coldwater ...	12	609	8,111 64	6,903 66	1,136 49	481 64	1,618 13
Thamesford..	10	400	4,996 31	4,705 30	1,190 52	249 94	1,440 46
Thorndale ...	10	257	2,794 74	2,532 24	638 41	109 92	748 33
Toronto Twp.	17	....	778 22	....	3,744 18	1,358 65	5,102 83
			12,901,125 40	9,751,706 82	2,012,754 07	661,949 23	2,674,703 30

"B"—Continued

for Period ending December 31st, 1914

Revenue	Surplus	Depreciation Charge	Surplus less Depreciation Charge	Number of Consumers				Per Cent of Consumers to Population	H. P. taken in Dec. 1914
				Domestic	Com'l	Power	Total		
$ c.	$ c.	$ c.	$ c.						
1,253 56	335 23	200 00	135 23	100	4	1	105	a 10.7	15
5,101 41	962 22	425 00	537 22	70	60	3	133	13.6	111
3,580 90	1,110 94	535 00	575 94	125	35	2	162	17.2	56
....	....	....	....	100	60	......	160	17.2	67
8,110 01	2,209 82	950 00	1,259 82	229	72	12	313	d 37.3	73
1,786 80	276 14	247 50	28 64	68	35	......	103	12.4	41
3,529 80	822 32	420 00	402 32	71	24	5	100	12.4	64
2,631 67	523 25	350 00	173 25	57	48	2	107	13.8	60
6,533 72	1,083 65	280 00	803 65	82	......	4	86	12.1	154
....	....	....	....	......	......	2	2	....	....
....	....	....	....	50	25	......	75	12.5	29
403 02	214 29	....	214 29	58	54	1	113	19.2	48
6,385 37	2,298 97	400 00	1,898 97	31	12	4	47	9.4	126
....	....	....	....	40	20	......	60	11.9	54
2,940 06	1,257 69	275 00	982 69	54	7	3	64	9.8	29
2,588 67	970 54	380 00	590 54	62	39	2	103	16.9	31
2,035 84	595 43	250 00	345 43	44	26	2	72	18.0	37
1,069 59	321 21	130 00	191 21	34	18	1	53	20.6	13
8,151 12	3,048 29	....	3,048 29	155	......	5	160	....	84
3,433,936 16	759,232 86	357,883 31	401,349 55	75,147	18,132	3,565	96,744	....	....

Note "a"—Competitive territory.
"b"—Includes some rural load.
"d"—Includes summer cottages.
"e"—Approximate figures, subject to final audit.
"f"—Loss.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Toronto		Hamilton	
Population	445,575		100,808	
—	1913	1914	1913	1914
	a	a		a
EARNINGS	$ c.	$ c.	$ c.	$ c.
Domestic Light	190,376 89	289,645 45	34,451 95	74,668 38
Commercial Light	233,799 04	305,534 31	25,453 99	35,125 57
Power	347,708 88	483.681 15	47,415 58	70,665 43
Street Light	344,933 79	364.214 17	2,250 89	51,154 36
Miscellaneous	29,891 21	39,651 98	9,841 52	2,564 82
Total Earnings	1,146,709 81	1,482,727 06	119,413 93	234,178 56
EXPENSES				
Power Purchased	255,986 26	323,586 97	47,307 65	78.968 72
Sub-Station Operation	32,216 66	42,667 33	3,240 97	5,741 24
" " Maintenance	11,510 69	23,560 14	94 01	653 61
Distribution System, Operation and Maintenance	50,693 34	59,013 81	3,168 21	6,504 84
Line Transformer Maintenance	3,396 98	5,218 22	1,216 21	505 26
Meter "	1,648 28	3,072 21	16 39	143 97
Consumers' Premises-Expense	36,536 64	52,893 31	2,693 70	2,782 23
Street Light System, Operation and Maintenance	45,801 72	48,674 18	1,375 46	13,380 35
Promotion of Business	60,256 03	71,477 64	4,391 01	3,999 76
Billing and Collecting	43,581 71	50,028 39	6,270 38	10,825 27
General Office, Salaries and Expenses	85,957 58	125,972 92	3,623 22	12,894 66
Undistributed Expenses	44,304 25	54,191 98	1,289 35	3,407 34
Interest and Debenture Payments	274,285 24	325,551 67	30,201 49	46,398 68
Miscellaneous Expenses	....	b 4,335 80	....	....
Total Expenses	946,175 38	1,190,244 57	104,888 05	186,205 93
Surplus	200,534 43	292,482 49	14,525 88	47,972 63
Loss	....	....	....	....
Depreciation Charge	115,236 80	147,181 40	9,031 35	21,053 66
Surplus less Depreciation Charges	85,297 63	145,301 09	5,494 53	26,918 97

Notes.—
"a" Approximate figures only. Accounts not finally audited
"b" Patriotic Fund Contributions

'C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

Ottawa 100,180		London 55,026		Brantford 26,454	Windsor 22,080	Peterboro' 20,150
1913	1914	1913	1914	1914	1914	1914
				e	f	g
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
68,032 27	68,767 48	41,172 64	57,473 08	7,103 77	3,143 41	8,661 71
53,438 04	51,769 72	39,256 07	47,593 44	5,392 87	1,107 38	7,749 91
26,978 76	31,748 23	79,659 78	130,936 35	647 69	9 77	7,013 23
49,199 57	50,439 29	28.372 20	30,535 83	21,724 64	3,997 85	3,081 59
....	186 11	3,763 78	3,313 10	627 57	....	....
197,648 64	202,910 83	192,224 47	269,851 80	35,496 54	8,258 41	26,506 44
50,750 00	55,512 39	72,676 41	97,404 63	12,999 65	4,330 41	11,920 90
3,127 63	3,321 20	5,816 18	9,925 89	1,069 43	408 67	840 05
107 58	300 81	519 81	767 40	7 84	....	9 08
13,694 44	17,041 58	5,342 67	3,850 78	376 83	240 41	996 31
245 82	1,996 40	1,674 88	760 87	65 26	....	26 35
1,537 17	2,390 11	138 23	95 60	10 08	....	6 52
10,572 43	6,082 30	1,827 71	2,119 53	40	....	....
15,465 59	15,318 91	5,278 72	8,511 05	1,460 00	....	1,465 01
1,008 50	1,060 00	5,833 84	5,840 01	1.608 37	....	....
6,417 69	7,481 30	6,738 13	9,126 81	994 63	441 36	242 70
6,941 68	9,604 33	14,180 20	16,845 61	1,069 66	2,170 90	3,777 45
1,453 47	2,350 91	6,297 08	6,687 31	215 98	....	214 94
30,961 54	38,002 88	29,488 97	35,127 20	7,444 31	666 66	2,026 21
....	....	....	....	....	....	....
142,283 54	160,463 12	155,812 83	197,062 69	27,322 44	8,258 41	21.525 52
55,365 10	42,447 71	36,411 64	72,789 11	8,174 10	....	4,980 92
....	....	....	....	....	....	....
24,000 00	32,650 00	21,058 82	27,588 39	6,000 00	....	....
31,365 10	9,797 71	15,352 82	45,200 72	2,174 10	....	4,980 92

Notes—
"e" 9 months' operation
"f" 4 months' operation
"g" 3 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Berlin		Port Arthur	
Population	18,323		18,025	
—	1913	1914	1913	1914
	k			
EARNINGS	$ c.	$ c.	$ c.	$ c.
Domestic Light	16,558 82	17,757 08	81,830 66	38,097 65
Commercial Light	20,985 35	19,549 45	h	32,933 91
Power	38,368 34	49,173 17	78,193 51	92,804 49
Street Light	17,373 81	16,544 11	14,709 41	15,458 88
Miscellaneous	1,268 87	1,726 92	....	....
Total Earnings	94,555 19	104,750 73	174,733 58	179,294 93
EXPENSES				
Power Purchased	33,359 47	40,275 75	43,664 83	53,412 42
Sub-Station Operation	4,892 72	4,282 95	3,652 53	3,268 30
" " Maintenance	1,175 64	294 68	2,140 94	4,323 79
Distribution System, Operation and Maintenance	1,575 15	4,411 10	9,013 80	8,003 88
Line Transformer Maintenance	205 39	20 35	1 75	454 62
Meter "	326 51	564 97	112 13	670 91
Consumers' Premises—Expense	101 97	75 83	322 64	945 31
Street Light System, Operation and Maintenance	2,803 88	3,884 76	1,543 03	2,146 96
Promotion of Business	452 28	630 50	361 85	100 85
Billing and Collecting	1,901 40	2,259 54	2,630 19	5,324 25
General Office, Salaries and Expenses	2,532 25	2,615 07	2,613 61	2,557 42
Undistributed Expenses	1,966 04	1,966 38	2,012 67	2,357 63
Interest and Debenture Payments	17,897 45	18,719 43	37,556 73	40,489 67
Miscellaneous Expenses	....	b 619 00	....	....
Total Expenses	69,190 15	80,620 31	105,626 70	124,056 01
Surplus	25,365 04	24,130 42	69,106 88	55,238 92
Loss	....	....	....	....
Depreciation Charge	10,980 79	12,884 05	13,647 55	16,469 79
Surplus less Depreciation Charge	14,384 25	11,246 37	55,459 33	38,769 13

Notes —
"h" Domestic and Commercial light not divided
"b" Patriotic Fund Contributions
"k" 13 months' operation

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

St. Thomas		Stratford		Guelph		St.Catharines
16,794		16,425		16,319		16,186
1913	1914	1913	1914	1913	1914	1914
						g
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
11,125 50	13,221 00	11,636 59	15,180 91	11,528 09	16,920 54	2,013 49
16,097 41	13,480 75	17,033 98	16,336 30	15,075 61	15,923 51	412 75
36,550 23	44,247 13	15,123 78	16,519 24	42,091 34	38,148 46	12,742 98
10,989 22	11,025 36	12,120 00	12,120 00	9,500 04	9,590 66	944 63
361 15	869 76	69 33	1,319 04	2,531 74	1,516 42	44 28
75,124 04	82,844 00	55,983 68	61,475 49	80,726 82	82,099 59	16,158 13
31,435 85	38,279 18	22,028 75	25,875 69	32,473 66	30,460 41	9,328 14
2,452 25	2,571 06	1,651 06	1,557 16	1,700 14	540 50	579 90
913 99	80 40	200 54	16 70	1,076 44	733 05	46 19
1,580 22	2,989 04	1,630 72	2,516 22	3,004 51	3,897 65	249 06
47 57	77 64	148 48	1 56	179 90	161 05	640 56
53 40	183 34	261 33	37 34	585 91	711 63	152 97
....	....	501 90	....	206 39	....	....
2,405 21	3,023 53	1,509 91	926 11	1,566 58	1,380 19	443 16
....	....	....	62 45	....	....	981 77
339 43	1,604 98	1,325 47	1,647 47	430 35	2,257 35	107 00
1,593 77	2,733 80	2,339 27	1,918 44	3,424 77	3,003 77	607 53
739 67	967 72	211 15	1,211 78	1,730 98	2,351 61	....
7,402 65	7,406 14	10,536 75	12,989 75	10,273 27	10,273 27	1,105 87
....	....	....	b 1,750 00	d 884 95	d 834 02	....
48,964 01	59,916 83	42,345 33	50,724 89	57,567 85	56,604 50	14,242 15
26,160 03	22,927 17	13,638 35	10,750 60	23,158 97	25,495 09	1,915 98
....	....	....	....	....	....	....
6,900 00	7,350 00	3,420 00	4,631 50	8,000 00	10,200 00	850 00
19,260 03	15,577 17	10,218 35	6,119 10	15,158 97	15,295 09	1,065 98

Notes —
"d" Motor Repairs on leased motors
"b" Patriotic Fund Contributions
"g" 3 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Galt		Woodstock	
Population	11,932		10,154	
—	1913	1914	1913	1914
EARNINGS	$ c.	$ c.	$ c.	$ c.
Domestic Light	10,535 38	15,797 16	6,495 02	8,807 40
Commercial Light	11,648 49	11,952 75	12,942 32	11,610 14
Power	16,575 61	23,826 87	20,262 52	19,832 26
Street Light	6,280 25	8,500 00	7,160 00	7,320 00
Miscellaneous	194 00	919 15	354 18	471 80
Total Earnings	45,233 73	60,995 93	47,214 04	48,041 60
EXPENSES				
Power Purchased	17,883 91	21.134 48	18,798 66	18,690 30
Sub-Station Operation	1,761 14	1,930 95	1,834 83	2,149 53
" " Maintenance	180 76	99 42	497 39	83 02
Distribution System, Operation and Maintenance	446 24	1,729 80	1,827 65	1,566 91
Line Transformer Maintenance	11 48	129 05	4 84	23 75
Meter "	2 00	91 88	70 75	57 05
Consumers' Premises—Expense	....	208 54	345 00	....
Street Light System, Operation and Maintenance	296 88	2,234 06	1,142 30	1,665 72
Promotion of Business	....	....	....	....
Billing and Collecting	1,188 20	1,868 30	1,115 75	1,628 44
General Office, Salaries and Expenses	1,792 40	1,618 71	2,513 73	3,050 10
Undistributed Expenses	....	187 55	447 96	581 45
Interest and Debenture Payments	9,721 64	10,337 35	6,853 83	7.219 04
Miscellaneous Expenses	....	....	....	b 500 00
Total Expenses	33,284 65	41,570 20	35,806 87	37,215 31
Surplus	11,949 08	19,425 73	11,407 17	10,826 38
Loss	....	....	....	....
Depreciation Charge	8,400 00	10,600 00	5,827 40	6,450 00
Surplus less Depreciation Charge	3,549 08	8,825 73	5,579 77	4,376 38

Note —
"b" Contribution to Patriotic Fund

"C"—Continued

Hydro Municipalities for the years ending December 31st, 1913 and 1914

Barrie 7,215		Welland 7,208		Collingwood 6,646		Midland 6,253	
1913	1914	1913	1914	1913	1914	1913	1914
		f					
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
10,071 55	11,149 49	1,369 67	4,411 20	8,775 83	7,857 86	6,095 11	6,941 07
9,252 70	9,464 64	558 46	1,676 38	7,600 00	7,555 54	6,104 16	5,048 06
3,393 45	3,712 24	4,307 21	8,305 71	896 72	5,165 39	5,700 22	6,484 43
4,292 53	4,572 75	1,395 00	5,049 00	3,802 88	4,647 00	3,463 07	3,728 76
583 28	137 89	....	....	106 21	....	....	13 71
27,593 51	29,037 01	7,630 34	19,442 29	21,181 64	25,225 79	21,362 56	22,216 03
6,611 27	10,873 86	4,861 38	7,598 77	7,480 48	10,450 24	6,059 33	6,539 10
5,706 97	2,745 68	295 43	406 99	1,952 60	2 25	....	....
....	....	....	32 30	....	10 51	....	....
679 16	448 87	191 18	138 94	1,374 21	749 16	989 11	1,284 29
....	....	32 82	107 53	9 19	36 83	57 20	420 06
17 92	....	50	57 21	13 37	15 25	....	....
....	....	....	....	....	....	....	....
402 06	108 02	123 82	446 23	133 20	664 19	526 53	1,020 22
....	....	....	....	....	....	....	....
....	....	317 42	748 38	252 08	302 39	221 04	157 39
3,578 67	2,294 92	798 53	2,790 59	2,066 94	1,916 97	1,435 86	1,692 75
544 58	510 67	39 45	10 25	209 90	173 18	....	107 63
5,590 40	6,052 29	2,638 54	5,080 20	4,277 77	4,369 96	4,134 55	4,267 05
23,131 03	23,044 31	9,299 07	17,417 39	17,769 94	18,690 93	13,423 62	15,488 49
4,462 48	5,992 70	....	2,024 90	3,411 70	6,534 86	7,938 94	6,727 54
....	....	1,668 73	....	....	....	....	....
3,359 00	3,500 00	....	....	2,390 00	2,400 00	2,950 00	3,200 00
1,112 48	2,492 70	....	2,024 90	1,021 70	4,134 86	4,988 94	3,527 54

Note—
"f" 4 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Ingersoll		Preston	
Population	5,149		4,923	
—	1913	1914	1913	1914
Earnings	$ c.	$ c.	$ c.	$ c.
Domestic Light	3,595 03	5,085 82	5,477 10	6,520 39
Commercial Light	6,048 51	6,359 72	5,366 77	5,011 15
Power	15,293 44	12,818 27	21,017 68	21,975 26
Street Light	4,262 02	3,960 04	2,594 55	2,778 48
Miscellaneous	976 99	250 88	232 47	98 53
Total Earnings	30.176 00	28,474 73	34,688 57	36,383 81
Expenses				
Power Purchased	11,966 61	11,441 79	16,673 20	17,460 00
Sub-Station Operation	828 83	907 02	1,459 16	1,509 01
" " Maintenance	....	....	49 21	28 33
Distribution System, Operation and Maintenance	422 13	535 79	1,238 36	2,368 26
Line Transformer Maintenance	187 39	113 54	280 22	139 99
Meter "	97 00	360 05	79 67	86 01
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	440 09	274 54	431 92	523 05
Promotion of Business	....	....	....	....
Billing and Collecting	560 15	543 73	656 75	739 90
General Office, Salaries and Expenses	1,615 40	1,471 88	415 98	568 69
Undistributed Expenses	195 56	71 63	183 85	585 82
Interest and Debenture Payments	5,337 25	5,198 90	4,120 54	7,300 84
Total Expenses	21,650 41	20,918 87	25,588 86	31,309 90
Surplus	8,525 59	7,555 86	9,099 71	5,073 91
Loss	....	....	....	....
Depreciation Charge	2,862 00	3,168 00	2,924 00	3,400 00
Surplus less Depreciation Charge	5,663 59	4,387 86	6,175 71	1,673 91

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

Dundas		Goderich	Waterloo		Walkerville	Paris
4,866		4,811	4,737		4,721	4,216
1913	1914	1914	1913	1914	1914	1914
			k		j	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
3,045 85	5,349 24	7,197 05	4,263 66	4,723 94	3,037 96	4,766 23
4,193 27	4,198 64	4,196 49	5,098 42	4,825 22	1,492 84	2,778 00
3,070 40	4,305 96	1,240 73	14,970 14	13,282 12	6,042 11	1,419 90
60 10	3,050 85	5,525 00	5,294 10	5,137 84	1,716 61	4,103 00
930 81	....	....	....	477 61	....	....
11,300 43	16,904 69	18,159 27	29,626 32	28,446 73	12,289 52	13,067 22
3,474 08	4,038 10	6,315 17	11,075 53	9,882 03	6,104 53	4,020 80
....	....	1,806 40	1,019 10	924 41	259 76	1,082 57
....	....	....	81 00	182 23	1 75	....
154 77	840 00	167 83	378 74	794 51	502 81	1,299 26
35 80	74 75	11 25	32 13	42 90	3 00	13 45
4 40	31 18	15 94	54 67	193 53	13 25	....
....	84 68	....	....	....	....	....
....	285 34	68 20	1,093 25	459 21	10 58	333 09
....	789 93	....	....	....	....	....
689 51	937 59	343 13	866 90	756 25	562 05	....
1,642 56	1,876 50	204 85	2,520 00	2,519 64	1,499 11	563 26
....	138 32	154 40	709 44	323 72	374 34	115 30
1,970 14	4,504 12	4,182 09	3,676 92	3,473 33	1,908 19	5,849 94
7,971 26	13,600 51	13,269 26	21,507 68	19,551 76	11,239 37	13,277 67
3,329 17	3,304 18	4,890 01	8,118 64	8,894 97	1,050 15	....
....	....	....	....	....	....	210 45
1,508 00	1,675 00	2,920 00	3,100 00	3,500 00	....	....
1,821 17	1,629 18	1,970 01	5,018 64	5,394 97	1,050 15	....

Notes —
"j" 5 months' operation
"k" 13 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Penetanguishene		St. Mary's	
Population	3,963		3,783	
—	1913	1914	1913	1914
Earnings	$ c.	$ c.	$ c.	$ c.
Domestic Light	1,989 80	1,936 73	3,815 77	4,614 95
Commercial Light	4,511 16	3,064 83	4,553 73	4,733 33
Power	8,775 95	8,001 69	8,221 72	10,610 05
Street Light	2,042 00	2,016 00	3,582 00	3,441 00
Miscellaneous	....	....	....	....
Total Earnings	17,318 91	15,019 25	20,173 22	23,399 33
Expenses				
Power Purchased	6,347 56	7,673 95	10,055 82	8,966 67
Sub-Station Operation	967 84	725 24	728 39	803 25
" " Maintenance	....	3 25	150 46	195 00
Distribution System, Operation and Maintenance	301 41	166 21	556 05	400 29
Line Transformer Maintenance	236 11	93 51	519 39	350 34
Meter "	....	178 86	202 56	175 22
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	144 56	335 99	554 36	423 60
Promotion of Business	....	131 74	....	....
Billing and Collecting	44 45	133 00	263 21	257 03
General Office, Salaries and Expenses	1,278 02	1,305 25	1,077 38	994 13
Undistributed Expenses	....	3 00	75 63	138 54
Interest and Debenture Payments	2,035 90	1,986 09	4,616 15	4,658 00
Total Expenses	11,355 85	12,736 09	18,799 40	17,362 07
Surplus	5,963 06	2,283 16	1,373 82	6,037 26
Loss	....	....	....	....
Depreciation Charge	1,820 00	1,960 00	....	3,340 00
Surplus less Depreciation Charge	4,143 06	323 16	1,373 82	2,697 26

"C"—Continued

Hydro Municipalities for the years ending December 31st, 1913 and 1914

Brampton		Tillsonburg		Hespeler		Prescott
3,344		3,155		3,086		2,877
1913	1914	1913	1914	1913	1914	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
5,617 61	6,798 89	2,796 57	3,367 74	2,206 75	2,635 41	7,472 75
3,985 65	4,055 99	4,677 38	4,579 37	1,667 00	1,934 75	996 00
10,557 72	10,658 33	4,763 13	6,303 09	5,044 30	6,116 27	1,099 27
3,500 00	4,200 00	2,601 00	2,463 96	1,500 00	1,478 00	2,500 00
....	....	1,163 11	863 28	....	....	9 00
23,661 98	25,713 21	16,001 19	17,577 44	10,418 05	12,164 43	12.077 02
11,084 34	11,692 39	6,249 35	6,999 79	5,465 01	4,753 26	1,422 26
26 11	58 58	950 05	753 91	2,101 87	614 43	3,293 49
....	....	....	....	....	....	361 49
231 54	522 54	332 50	570 90	638 83	565 16	767 49
16 00	197 15	4 89	11 55	4 17	54 05	....
....	51 31	....	16 47	....	....	116 10
....	....	....	....	....	....	....
168 79	429 60	205 87	210 50	57 50	111 92	119 00
....	....	....	....	....	....	....
341 70	794 57	907 04	923 46	....	....	37 82
1,694 67	1,904 94	1,064 21	997 04	735 23	1,207 23	1,165 23
371 28	66 47	1,033 61	1,000 00	272 67	112 50	169 62
3,781 42	4,936 36	2,137 07	2,727 41	2,140 19	3,144 33	1,722 31
17,716 05	20,653 91	12,884 59	14,211 21	11,415 47	10,562 88	9,174 81
5,945 93	5,059 30	3,116 60	3,366 23	....	1,601 55	2,902 21
....	....	....	....	997 42	....	....
2,500 00	3,000 00	1,782 75	1,830 00	....	1.350 00	1,950 00
3,445 93	2,059 30	1,333 85	1,536 23	....	251 55	952 21

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Weston		Elmira	Clinton
Population	2,307		2,134	2,112
——	1913	1914	1914	1914
			k	
EARNINGS	$ c.	$ c.	$ c.	$ c.
Domestic Light	4,117 20	3,741 84	1,968 41	2,023 70
Commercial Light	1,475 74	1,599 97	2,020 81	2,028 08
Power	6,170 36	4,958 59	1,876 49	1,255 33
Street Light	2,052 00	3,067 50	1,680 00	1,105 66
Miscellaneous	24 88	....	....	....
Total Earnings	13,840 18	13,367 90	7,545 71	6,412 77
EXPENSES				
Power Purchased	5,159 49	5,783 87	3,077 56	2,291 20
Sub-Station Operation	....	....	....	911 74
" " Maintenance	....	....	....	....
Distribution System, Operation and Maintenance	791 77	662 71	....	80 99
Line Transformer Maintenance	....	....	....	....
Meter "	....	....	....	....
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	574 25	451 99	102 55	145 74
Promotion of Business	....	....	....	....
Billing and Collecting	....	....	....	....
General Office, Salaries and Expenses	927 35	1,668 62	1,170 47	1,182 42
Undistributed Expenses	79 50	76 17	31 17	32 29
Interest and Debenture Payments	1,588 48	1,588 42	1,425 22	1,838 56
Total Expenses	9,120 84	10,231 78	5,806 97	6,483 14
Surplus	4,719 34	3,136 12	1,738 74	....
Loss	....	....	....	70 37
Depreciation Charge	1,390 00	1,450 00	650 00	....
Surplus less Depreciation Charge	3,329 34	1,686 12	1,088 74	....

Note—
"k" 13 months' operation

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

Milton		Georgetown		Seaforth	
2,053		1,965		1,901	
1913	1914	1913	1914	1913	1914
		f			
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1,149 28	1,961 22	661 49	3,069 02	2,124 18	2,467 36
1,212 26	2,226 80	842 87	2,362 33	2,876 47	2,581 30
6,462 38	11,325 61	234 32	2,976 61	7,509 99	7,707 01
900 00	1,350 00	541 67	1,843 67	1,815 81	1,869 96
143 18	455 62	....	....	61 63	110 14
9,867 10	17,319 25	2,280 35	10,251 63	14,388 08	14,735 77
4,962 34	7,696 45	759 00	4,183 72	7,931 55	8,646 18
....	....	....	....	....	....
....	....	....	....	....	....
167 82	609 66	12 85	192 11	1,573 93	1,078 00
....	....	....	....	....	....
....	....	....	....	....	....
....	....	....	....	....	....
....	86 16	201 06	128 09	317 37	638 57
....	....	....	....	....	....
....	....	....	....	....	....
42 27	572 05	....	895 46	368 67	529 05
....	....	....	....	....	....
1,582 93	2,277 04	....	1,466 55	1,653 65	1,704 25
6,695 36	11,241 36	972 91	6,865 93	11,845 17	12,596 05
3,171 74	6,077 89	1,307 44	3,385 70	2,542 91	2,139 72
....	....	....	....	....	....
900 00	1,250 00	300 00	850 00	1,300 00	1,400 00
2,271 74	4,827 89	1,007 44	2,535 70	1,242 91	739 72

Note—
"f" 4 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Mimico		Mitchell	
Population	1,758		1,746	
—	1913	1914	1913	1914
Earnings	$ c.	$ c.	$ c.	$ c.
Domestic Light	2,021 06	5,085 16	2,424 59	2,470 29
Commercial Light	h	h	2,813 92	2,712 55
Power	795 49	963 64	6,160 53	3,944 91
Street Light	987 00	1,049 34	1,675 00	1,950 00
Miscellaneous	....	....	385 50	443 90
Total Earnings	3,803 55	7,098 14	13,459 54	11,521 65
Expenses				
Power Purchased	1,740 66	2,801 90	6,858 86	4,882 39
Sub-Station Operation	....	....	12 35	....
" " Maintenance	....	....	....	....
Distribution System, Operation and Maintenance	144 79	53 29	81 25	66 52
Line Transformer Maintenance	....	....	....	....
Meter "	....	....	....	....
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	23 89	88 85	44 64	34 12
Promotion of Business	....	....	....	....
Billing and Collecting	....	....	....	....
General Office, Salaries and Expenses	265 61	674 73	1,223 80	1,315 10
Undistributed Expenses	....	....	100 00	....
Interest and Debenture Payments	845 02	1,561 45	2,224 07	2,224 06
Total Expenses	3,019 97	5,180 22	10,544 97	8,522 19
Surplus	783 58	1,917 92	2,914 57	2,999 46
Loss	....	....	....	....
Depreciation Charge	740 00	920 00	1,150 00	1,200 00
Surplus less Depreciation Charge	43 58	997 92	1,764 57	1,799 46

Note—
"h" Domestic and Commercial light not divided

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

New Hamburg 1,735		Acton 1,634		Norwich 1,185	
1913	1914	1913	1914	1913	1914
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1,589 21	1,779 90	1,236 50	1,463 72	1,926 78	2,168 13
1,890 72	1,403 56	1,567 48	1,496 18	1,162 98	995 16
5,792 20	5,209 51	318 77	836 13	1,978 55	1,893 72
1,827 00	1,827 00	1,000 00	1,563 00	1,285 50	1,197 00
325 44	....	286 72	83 60	46 71	746 92
11,424 57	10,219 97	4,409 47	5,442 63	6,400 52	7,000 93
5,206 00	4.770 26	1,801 50	2,344 50	3,176 24	2,849 30
....	....	....	....	....	....
....	....	....	....	....	....
323 40	380 19	371 97	35 42	178 90	464 80
....	....	....	....	....	13 48
....	....	....	....	....	37 11
....	....	....	....	....	....
....	....	7 20	147 12	79 51	95 40
....	....	....	....	....	....
....	....	....	....	....	....
1,194 68	995 47	841 70	943 77	838 27	534 15
....	107 21	....	....	....	....
1,170 92	1,172 91	442 00	1,124 06	886 40	960 58
7,895 00	7,426 04	3,584 37	4,594 87	5,159 32	4,954 82
3,529 57	2,793 93	825 10	847 76	1,241 20	2,046 11
....	....	....	....	....	....
900 00	900 00	500 00	500 00	500 00	530 00
2,629 57	1,893 93	325 10	347 76	741 20	1,516 11

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Elora	Port Dalhousie		Caledonia
Population	1,225	1,281		1,175
——	1914	1913	1914	1913
	i	m		
Earnings	$ c.	$ c.	$ c.	$ c.
Domestic Light	101 98	3,742 54	3,656 01	404 60
Commercial Light	167 25	h	h	h
Power	....	347 28	429 54	470 34
Street Light	110 33	1,246 67	880 00	584 00
Miscellaneous	....	....	....	....
Total Earnings	379 56	5,336 49	4,965 55	1,458 94
Expenses				
Power Purchased	133 05	2,393 00	2,407 20	766 70
Sub-Station Operation	....	....	....	....
" " Maintenance	....	....	....	....
Distribution System, Operation and Maintenance	....	253 81	421 83	23 05
Line Transformer Maintenance	....	....	....	....
Meter "	....	....	....	....
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	24 78	8 74	65 28	....
Promotion of Business	....	....	....	....
Billing and Collecting	....	....	....	....
General Office, Salaries and Expenses	66 19	302 30	712 50	48 28
Undistributed Expenses	....	112 98	218 83	....
Interest and Debenture Payments	125 35	814 89	725 89	134 47
Total Expenses	349 37	4,785 72	4,551 53	972 50
Surplus	30 19	550 77	414 02	486 44
Loss	....	....	....	....
Depreciation Charge	....	450 00	414 02	250 00
Surplus less Depreciation Charge	30 19	100 77	....	236 44

Notes —
"h" Domestic and Commercial light not divided
"i" 1 months' operation
"m" 16 months' operation

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

Caledonia	Winchester	Stayner		New Toronto	Hagersville	
1,175	1,099	1,033		985	977	
1914	1914	1913	1914	1914	1913	1914
o		n			g	
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
880 54	2,972 09	158 48	909 58	653 56	81 42	1,222 33
h	h	116 91	747 93	h	h	h
188 54	....	301 86	1,699 08	....	746 85	2,679 08
780 00	1,500 00	35 00	707 50	600 00	300 00	1,200 00
....	....	....	....	....	....	....
1,849 08	4,472 09	612 25	4,064 09	1,253 56	1,128 27	5,101 41
669 00	1,827 07	187 52	2,726 45	233 30	967 23	3,084 34
....	....	....	....	....	....	....
....	....	....	....	....	....	....
92 95	2 32	....	56 85	50 73	....	52 15
....	....	....	....	....	....	....
....	....	....	....	....	....	....
....	....	....	....	....	....	....
35 80	58 50	....	96 00	137 85	....	73 00
....	....	....	....	....	....	....
....	....	....	....	....	....	....
66 82	173 09	14 48	31 00	318 01	37 69	545 77
....	....	....	....	....	....	....
122 86	541 80	340 82	784 66	178 44	97 60	383 93
987 43	2,602 78	542 82	3,694 96	918 33	1,102 52	4,139 19
861 65	1,869 31	69 43	369 13	335 23	25 75	962 22
....	....	....	....	....	....	....
260 00	500 00	....	115 00	200 00	....	425 00
601 65	1,369 31	69 43	254 13	135 23	....	537 22

Notes—
"h" Domestic and Commercial light not divided
"g" 3 months' operation
"n" 2 months' operation
"o" 10 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Pt. Credit		Pt. Stanley	
Population	944		934	
—	1913	1914	1913	1914
EARNINGS	$ c.	$ c.	$ c.	$ c.
Domestic Light	1,963 22	2,461 42	1,828 66	2,066 41
Commercial Light	c	c	1,771 70	1,753 60
Power	848 59	308 88	2,418 00	2,170 88
Street Light	696 00	810 60	2,199 50	1,961 35
Miscellaneous	....	....	....	157 77
Total Earnings	3,507,81	3,580 90	8,217 86	8,110 01
EXPENSES				
Power Purchased	1,210 65	1,333 00	3,506 43	3,682 26
Sub-Station Operation	....	....	....	....
" " Maintenance	....	....	....	....
Distribution System, Operation and Maintenance	22 21	23 51	354 49	116 92
Line Transformer Maintenance	....	....	....	....
Meter "	....	....	....	....
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	121 27	72 77	....	....
Promotion of Business	....	....	....	....
Billing and Collecting	....	....	292 81	286 23
General Office, Salaries and Expenses	171 82	450 67	368 47	581 96
Undistributed Expenses	....	18 46	....	....
Interest and Debenture Payments	534 23	571 55	1,188 91	1,232 82
Total Expenses	2,060 18	2,469 96	5,711 11	5,900 19
Surplus	1,447 63	1,110 94	2,506 75	2,209 82
Loss	....	....	....	....
Depreciation Charge	446 00	535 00	617 75	950 00
Surplus less Depreciation Charge	1,001 63	575 94	1,889 00	1,259 82

Note—
"c" Domestic and Commercial light not divided

"C"—Continued

Hydro Municipalities for the years ending December 31st, 1913 and 1914

Chesterville 831	Waterdown 805		Elmvale 775		Baden 710	
1914	1913	1914	1913	1914	1913	1914
			w			
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
530 13	1,164 29	1,054 13	284 34	673 18	884 11	1,247 81
791 67	h	535 83	358 60	896 11	h	h
....	917 63	1,011 38	....	438 38	2,242 77	4,580 23
465 00	435 00	510 00	302 00	624 00	830 95	705 68
....	....	418 46	....	....	....	....
1,786 80	2,516 94	3,529 80	944 94	2,631 67	3,957 83	6,533 72
1,107 66	988 00	1,660 71	506 33	898 78	2,807 04	4,541 56
....	....	....	....	....	....	....
....	....	....	....	....	....	....
....	183 71	67 66	7 86	326 94	28 84	179 28
....	....	....	....	....	....	....
....	....	....	....	....	....	....
....	....	....	....	....	....	....
....	35 31	48 15	....	....	....	14 52
....	....	....	....	....	....	....
....	....	....	....	....	....	....
59 00	213 14	207 87	75 12	434 67	267 45	389 45
....	....	....	....	....	....	....
344 00	521 56	723 09	449 76	434 67	325 26	325 26
1,510 66	1,941 72	2,707 48	1,039 07	2,108 42	3,428 59	5,450 07
276 14	575 22	822 32	....	523 25	529 24	1,083 65
....	....	....	94 13	....	....	....
247 50	365 00	420 00	....	350 00	277 00	280 00
28 64	210 22	402 32	....	173 25	252 24	803 65

Notes—
"h" Domestic and Commercial light not divided
"w" 6 months' operation

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of

Municipality	Creemore	Beachville		Rockwood
Population	590	501		650
—	1914	1913	1914	1913
	n	x		f
EARNINGS	$ c.	$ c.	$ c.	$ 7c.
Domestic Light	97 31	562 37	587 33	230 27
Commercial Light	127 31	c	c	c
Power	39 60	5,993 81	5,368 04	480 82
Street Light	138 80	206 03	430 00	196 00
Miscellaneous	....	....	....	....
Total Earnings	403 02	6,762 21	6,385 37	907 09
EXPENSES				
Power Purchased	162 00	4,221 68	3,283 89	237 50
Sub-Station Operation	....	....	....	....
" " Maintenance	....	....	....	....
Distribution System, Operation and Maintenance	....	54 34	34 85	....
Line Transformer Maintenance	....	....	....	....
Meter "	....	....	....	....
Consumers' Premises—Expense	....	....	....	....
Street Light System, Operation and Maintenance	....	76 37	43 92	....
Promotion of Business	....	....	....	....
Billing and Collecting	....	....	....	....
General Office, Salaries and Expenses	6 14	249 50	193 11	44 46
Undistributed Expenses	....	127 62	29 18	....
Interest and Debenture Payments	20 59	288 88	501 45	357 49
Total Expenses	188 73	5,018 39	4,086 40	639 45
Surplus	214 29	1,743 82	2,298 97	267 64
Loss	....	....	....	....
Depreciation Charge	....	525 00	400 00	....
Surplus less Depreciation Charge	214 29	1,218 82	1,898 97	267 64

Notes —
"h" Domestic and Commercial light not divided
"f" 4 months' operation
"g" 3 months' operation
"n" 2 months' operation
"x" 24 months' operation

"C"—Continued

Hydro Municipalities for the year ending December 31st, 1913 and 1914

Rockwood	Coldwater		Thamesford	Thorndale	Toronto Township
650	609		400	257	
1914	1913	1914	1914	1914	1914
			o	o	p
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
848 55	735 68	853 56	393 49	446 27	8,151 12
h	h	589 85	323 92	h	......
1,542 01	247 19	617 26	946 32	329 27	......
549 50	532 00	528 00	372 16	294 00	......
......	......	......	......	......	......
2,940 06	1,514 87	2,588 67	2,035 89	1,069 54	8,151 12
1,113 49	535 86	897 12	1,031 10	510 00	3,085 55
......	......	......	......	......	......
......	......	......	......	......	......
......	74 58	139 37	9 80	5 25	284 02
......	......	......	......	......	......
......	......	......	......	......	......
......	......	......	......	......	......
36 14	32 92	32 00	23 68	29 04	......
......	......	......	......	......	......
......	......	......	......	......	......
119 55	1 50	68 00	125 94	94 12	374 61
......	......	......	......	......	......
413 19	......	481 64	249 94	109 92	1,358 65
1,682 37	644 86	1,618 13	1,440 46	748 33	5,102 83
1,257 69	870 01	970 54	595 43	321 21	3,048 29
......	......	......	......	......	......
275 00	375 00	380 00	250 00	130 00	......
982 69	495 01	590 54	345 43	191 21	3,048 29

Notes—
"h" Domestic and Commercial light not divided
"o" 10 months' operation
"p" 17 months' operation

STATEMENT "D"

Report Showing Comparative Revenue and Number of Consumers in Municipalities in which Hydro Power has been in use for Two Years or More.

Municipality	Year	Revenue				Consumers			
		Domestic Lt.	Commercial Lt.	Power	Street Lt.	Domestic	Commerc'l	Power	Total
		$ c.	$ c.	$ c.	$ c.				
Toronto	1912	201,554 74	*	225,451 55	275,666 23	11,441	*	518	11,959
	1913	190,376 89	233,799 04	347,708 88	344,933 79	16,519	4,764	1,037	22,320
	1914	289,645 45	305,534 31	483,681 15	364,214 17	23,181	6,276	1,494	30,951
Hamilton	1913	34,451 95	25,453 99	47,415 58	2,250 89	5,117	924	209	6,250
	1914	74,668 38	35,125 57	70,665 43	51,154 36	8,404	1,375	337	10,116
Ottawa	1912	62,598 18	51,365 91	25,299 94	40,970 21	5,390	440	90	5,920
	1913	68,032 27	53,438 04	26,978 76	49,199 56	5,766	818	152	6,736
	1914	68,767 48	51,769 72	31,748 23	33,895 95	6,342	852	156	7,350
London	1912	28,196 62	28,527 44	52,633 00	29,270 00	3,851	792	158	4,801
	1913	41,932 42	39,256 07	79,758 96	28,372 00	5,201	1,007	198	5,406
	1914	57,473 08	47,593 44	130,936 35	30,535 83	6,299	1,075	249	7,649
Berlin	1912	14,585 02	19,080 32	28,654 23	12,387 63	1,022	422	105	1,549
	1913	15,291 37	19,548 91	35,655 90	16,155 75	1,291	470	127	1,888
	1914	17,757 08	19,549 45	49,173 17	16,544 11	1,694	519	130	2,343
Pt. Arthur	1913	81,830 66	*	51,748 11	14,709 41	2,409	500	55	2,964
	1914	38,097 65	32,933 91	92,804 49	15,458 88	2,969	550	55	3,574
St. Thomas	1912	7,596 01	18,741 74	14,761 30	12,208 30	620	300	60	980
	1913	11,125 50	16,097 41	36,550 26	10,989 72	951	329	70	1,350
	1914	13,221 00	13,480 75	44,247 13	11,025 36	1,499	384	92	1,975
Stratford	1912	6,942 56	14,661 16	8,834 40	12,120 00	640	316	76	1,032
	1913	11,550 71	17,072 61	14,272 59	12,120 00	1,042	367	92	1,501
	1914	15,180 91	16,336 30	16,519 24	12,120 00	1,403	396	99	1,898
Guelph	1912	10,251 87	16,400 57	30,139 00	11,000 00	960	345	73	1,378
	1913	11,528 07	15,075 61	42,091 34	9,500 04	1,260	400	85	1,745
	1914	16,920 54	15,923 51	38,148 46	9,590 66	1,573	441	80	2,094
Galt	1912	8,183 69	9,732 86	10,042 59	5,000 70	830	250	47	1,127
	1913	10,535 38	11,648 49	16,575 61	6,280 25	1,122	353	65	1,540
	1914	15,797 16	11,952 75	23,826 87	8,500 00	1,745	339	70	2,154
Woodstock	1912	4,914 92	13,316 02	21,087 61	5,400 00	464	265	43	772
	1913	6,495 02	12,942 32	20,262 52	7,160 00	636	282	55	973
	1914	8,807 40	11,610 14	19,832 26	7,320 00	949	337	57	1,343
Barrie	1913	10,071 55	9,252 70	3,390 29	4,292 53	563	200	13	776
	1914	11,149 49	9,464 64	3,712 24	4,572 75	651	200	13	864
Welland	1913	1,369 67	558 46	4,307 21	1,395 00	408	53	18	479
	1914	4,411 20	1,676 38	8,305 71	5,049 00	492	53	23	568
Collingwood	1913	7,013 66	9,362 17	896 72	3,802 88	477	220	18	715
	1914	7,857 86	7,555 54	5,165 39	4,647 00	554	232	21	807
Midland	1912	5,878 05	5,878 05	3,188 03	3,777 65	420	165	18	603
	1913	6,095 11	6,104 16	5,700 22	3,433 07	191	172	25	688
	1914	6,941 07	5,084 06	6,484 43	3,728 76	621	176	32	829
Ingersoll	1912	3,073 73	6,648 28	14,430 66	3,000 00	220	142	38	400
	1913	3,595 03	6,048 51	15,293 44	4,262 03	278	170	44	492
	1914	5,085 32	6,359 72	12,818 27	3,960 04	416	194	48	658
Preston	1912	4,234 68	5,237 99	15,478 14	2,585 00	341	131	21	492
	1913	5,477 10	5,366 77	21,017 68	2,594 55	526	151	28	705
	1914	6,520 39	5,011 15	21,975 26	2,778 48	629	165	29	823
Dundas	1913	3,045 85	4,193 27	3,070 40	60 10	377	134	27	538
	1914	5,349 24	4,198 64	4,305 96	3,050 85	520	153	30	703
Waterloo	1912	4,057 46	4,524 93	11,545 93	4,538 82	239	112	35	386
	1913	4,263 66	5,098 42	14,970 14	5,294 10	321	125	44	490
	1914	4,723 94	4,825 22	13,282 14	5,137 84	430	153	51	634
Penetang	1912	1,676 26	3,836 30	2,207 51	1,962 00	101	87	13	201
	1913	1,989 80	4,511 16	8,775 95	2,042 00	128	91	15	234
	1914	1,936 73	3,064 83	8,001 69	2,016 00	153	100	15	268
St. Mary's	1912	4,967 16	4,069 20	6,001 30	3,449 50	240	143	20	403
	1913	3,815 77	4,553 73	8,221 72	3,582 00	396	160	29	588
	1914	4,614 95	4,733 33	10,610 05	3,441 00	454	161	30	645

STATEMENT "D"—Continued

Report Showing Comparative Revenue and Number of Consumers in Municipalities in which Hydro Power has been in use for Two Years or More.

Municipality	Year	Revenue: Domestic Lt.	Revenue: Commercial Lt.	Revenue: Power	Revenue: Street Lt.	Number of Consumers: Domestic	Number of Consumers: Commerc'l	Number of Consumers: Power	Number of Consumers: Total
		$ c.	$ c.	$ c.	$ c.				
Brampton	1912	3,004 66	2,893 74	3,531 34	3,500 00	409	104	12	525
	1913	5,617 61	3,986 65	10,557 72	3,500 00	643	138	16	797
	1914	6,798 89	4,055 99	10,658 33	4,200 00	627	174	21	822
Tillsonburg ...	1912	3,233 92	3,350 91	3,283 75	3,073 50	200	128	6	334
	1913	2,796 57	4,677 38	4,763 15	2,601 00	254	143	17	414
	1914	3,367 74	4,579 37	6,303 09	2,463 96	300	160	16	476
Hespeler......	1913	2,189 00	1,684 75	5,044 30	1,500 00	174	76	11	261
	1914	2,635 41	1,934 75	6,116 27	1,478 00	229	85	13	327
Weston.......	1912	3,979 81	750 00	1,674 28	1,788 00	225	15	4	344
	1913	4,117 20	1,475 74	6,166 97	2,052 00	360	34	6	400
	1914	3,741 84	1,599 97	4,958 59	3,067 50	352	78	10	440
Milton........	1913	1,149 28	1,212 26	6,462 38	900 00	110	74	5	189
	1914	1,961 22	2,226 80	11,325 61	1,350 00	150	79	6	235
Georgetown ..	1913	661 49	842 87	234 32	541 67	160	120	5	285
	1914	3,069 02	2,362 33	2,976 61	1,843 67	242	75	17	334
Seaforth......	1913	2,124 18	2,876 47	7,509 99	1,815 81	178	105	10	293
	1914	2,467 36	2,581 30	7,707 01	1,869 96	211	112	10	333
Mimico	1913	2,021 06	*	795 49	987 00	250	*	5	255
	1914	5,085 16	*	963 64	1,049 34	462	10	5	477
Mitchell	1912	2,964 48	2,977 08	4,597 03	1,375 00	159	79	13	251
	1913	2,362 52	2,813 92	6,160 53	1,675 00	179	85	16	270
	1914	2,470 29	2,712 55	3,944 91	1,950 00	191	100	16	307
New Hamburg.	1912	1,195 08	1,423 35	3,369 05	1,627 00	124	63	5	192
	1913	1,589 21	1,890 72	5,792 20	1,827 00	142	63	8	213
	1914	1,779 90	1,403 56	5,209 51	1,827 00	170	68	6	244
Acton	1913	1,236 50	1,567 48	318 77	1,000 00	82	62	3	147
	1914	1,463 72	1,496 18	836 13	1,563 00	146	58	5	209
Norwich	1912	862 17	674 48	263 93	591 00	128	64	2	194
	1913	1,926 78	1,162 98	1,978 55	1,285 50	166	76	3	245
	1914	2,168 13	995 16	1,893 72	1,197 00	198	84	3	285
Pt. Dalhousie.	1913	3,742 54	*	347 28	1,246 67	238	*	3	241
	1914	3,656 01	*	429 54	880 00	240	10	3	253
Caledonia.....	1913	404 60	*	470 34	584 00	17	16	1	34
	1914	880 54	*	188 54	780 00	21	32	1	54
Stayner	1913	158 48	116 91	301 86	35 00	120	30	2	152
	1914	909 58	747 93	1,699 08	707 50	108	56	2	156
Hagersville	1913	81 92	*	746 85	300 00	3	24	3	30
	1914	1,222 23	*	2,679 08	1,200 00	70	60	3	133
Pt. Credit	1913	1,963 22	*	848 59	696 00	93	21	2	116
	1914	2,461 42	*	308 88	810 00	125	35	2	162
Pt. Stanley ...	1912	897 02	1,106 63	1,314 70	1,545 10	122	40	3	165
	1913	1,828 06	1,771 70	2,418 00	2,199 50	182	60	9	251
	1914	2,066 41	1,753 60	2,170 83	1,961 35	229	72	12	313
Waterdown ...	1912	774 40	340 00	614 42	375 83	41	20	2	63
	1913	1,003 09	361 20	917 65	435 00	70	34	2	106
	1914	1,054 13	535 83	1,011 38	510 00	71	34	5	110
Elmvale......	1912	284 34	358 60	....	302 00	52	52	1	105
	1914	673 18	896 11	438 38	624 00	57	48	2	107
Baden........	1913	884 11	*	2,242 77	830 95	75	*	4	79
	1914	1,247 81	*	4,580 23	705 68	82	*	4	86
Beachville	1913	562 97	*	5,993 81	206 03	45	*	4	49
	1914	587 33	*	5,368 04	430 00	45	*	4	49
Rockwood	1913	230 27	*	480 82	196 00	48	9	1	58
	1914	848 55	*	1.542 01	549 50	54	7	3	64
Coldwater	1913	405 43	330 25	247 19	532 00	48	32	1	81
	1914	853 56	589 85	617 26	528 00	62	39	2	103

*Domestic and Commercial light not separated.

STATEMENT "E"

Street Light Installation in Hydro Municipalities, December 31st, 1914, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	No. of Arc Lights	Cost per Arc	Number of Incandescents	Size of Lamp	Cost per Incandescents	Total Cost	Cost per Capita
			$ c.			$ c.	$ c.	$ c.
Toronto......	445,575	....	....	40,594	100-watt	9 00	364,214 17	81
Hamilton.....	100,808	a 401	50 00	869 7,216 28	250-watt 100 " 40 to 150	13 75 8 00 8 00	51,146 90	50
Ottawa.......	100,180	720	45 00	234 2,870*	100-watt 100 "	10 00 60c. foot frontage	50,439 29	50
London.......	55,026	....	....	39 2,293 497	75 " 75 " 100 "	8 00 11 00 12 85	30,535 83	55
Brantford....	26,454	147	40 00	2,847	100 "	8 00	21,724 64	82
Windsor......	22,080	a 246	50 00	1,592	100-watt	12 00	3,997 85	b
Peterboro'....	20,150	151 54	50 00 50 50	202	100-watt	12 00	3,081 59	c
Berlin........	18,338	....	....	1,811	100 "	9 00	16,544 11	90
Port Arthur ..	18,025	....	....	1,582 708	100 " 50 "	8 30 5 00	15,458 88	94
St. Thomas...	16,794	44	53 00	953 380	75 " 30 "	10 00 5c. kw-hr	11,025 36	65
Stratford.....	16,425	a 180	....	700	75 "	....	12,120 00	74
Guelph.......	16,319	....	....	1,070	100 "	9 00	9,590 66	58
St. Catharines.	16,186	....	....	721	100 "	8 00	944 63	c d
Galt..........	11,932	a 77	....	40 789 369	60 " 75 " 100 "	8 50	8,500 00	71
Woodstock....	10,154	....	....	50 484 172	250 " 100 " 60 "	25 00 10 00 10 00	7,320 00	72
Barrie........	7,215	....	....	400	100 "	12 00	4,572 75	63
Welland......	7,208	....	....	345 96	100 " 250 "	9 00 18 00	5,049 00	70
Collingwood...	6,643	....	....	390	100 "	12 00	4,647 00	70
Midland......	6,253	16	35 00	235 36	100 " 50 "	13 50 3 60	3,728 26	60
Ingersoll.....	5,149	....	....	252 76	80 " 100 "	12 00 12 50	3,960 04	77

NOTES—"a" Nitrogen filled lamps. "b" 4 months operation. "c" 3 months operation. "d" Partial service only. * Installed on local improvement plan.

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1914, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	No. of Arc Lights	Cost per Arc	Number of Incandescents	Size of Lamps	Cost per Incandescent	Total Cost	Cost per Capita
			$ c.			$ c.	$ c.	$ c.
Preston........	4,923	....	....	203 46	50-watt 100 "	11 00 12 00	2,778 48	56
Goderich	4,811	....	....	16-3 lt. std. 8-1 " " 8-1 " " 275	.... 100-watt	55 00 40 00 25 00 15 00	5,525 00	1 15
Dundas........	4,866	....	....	300	100 "	9 00	2,450 81	51
Waterloo	4,737	....	....	44-5 lt. std. 8-3 " " 418 14	.... 75-watt 150 "	40 00 25 00 8 75 10 50	5,137 84	1 09
Walkerville...	4,721	....	....	435	60 "	10 50	1,716 61	e
Paris	4,216	....	....	350 23	100 " 100 "	11 00	4,103 00	97
Penetang	3,963	....	....	170	100 "	12 00	2,016 00	51
St. Mary's....	3,783	41	65 00	60 28	60 " 250 "	13 00 25 00	3,441 00	91
Brampton	3,344	....	....	525	100 "	8 00	4,200 00	1 25
Tillsonburg...	3,155	....	....	224	75 "	11 00	2,463 96	79
Hespeler	3,096	....	....	125	75 "	12 00	1,478 00	49
Prescott......	2 877	....	....	356	100-watt	......	2,500 00	87
Weston.......	2,307	....	....	207 8 clusters	100-watt	12 00 40 00	2,704 00	1 18
Elmira	2,134	....	....	142	100-watt	12 00	1,680 00	79
Clinton.......	2,112	....	....	132	60 "	12 50	1,105 66	52
Milton........	2,053	....	....	150	100 "	9 00	1,350 00	67
Georgetown ..	1,965	....	....	141	100 "	12 50	1,762 50	89
Seaforth	1,901	....	....	10 70 60	75 " 75 " 100 "	13 00 12 00 15 00	1,869 96	97
Mimico.......	1,758	....	....	109	100 "	11 00	1,049 34	60
Mitchell......	1,746	....	....	145	100 "	12 00	1,950 00	1 11

"e" 5 months operation.

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1914, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	No. of Arc Lights	Cost per Arc	Number of Incandescents	Size of Lamp	Cost per Incandescents	Total Cost	Cost per Capita
			$ c.			$ c.	$ c.	$ c.
New Hamburg.	1,735	....	....	208	100-watt	9 00	1,827 00	1 05
Acton	1,634	....	....	108	100 "	15 00	1,563 00	95
Fergus........	1,587	....	....	119	100 "	12 50	....	..
Norwich......	1,185	....	....	60 53	60 " 100 "	9 00 12 00	1,197 00	1 01
Elora	1,225	....	....	80	100 "	12 50	....	..
Pt. Dalhousie .	1,280	....	....	....	......	....	880 00	70
Caledonia	1,175	....	....	59	100-watt	12 00	780 00	70
Winchester...	1,099	....	....	100	100 "	15 00	1,500 00	1 35
Stayner......	1,033	....	....	46 15	60 " 100 "	9 00 12 00	707 50	69
Beaverton....	1,015	....	....	....	......	13 00	....	..
New Toronto .	985	....	....	50	100-watt	12 00	600 00	61
Hagersville...	977	....	....	100	100 "	12 00	1,200 00	1 22
Pt. Credit	944	....	....	79	100 "	11 00	810 60	89
Cannington...	934	....	....	....	......	13 00	....	..
Pt. Stanley...	849	....	....	111 47	100-watt 100 "	16 00 summer	1,961 35	..
Chesterville ..	833	....	....	53	100-watt	13 00	465 00	55
Waterdown...	805	....	....	56	100 "	10 00	510 00	62
Elmvale......	775	....	....	52	100 "	12 00	624 00	80
Baden........	710	....	....	58	100 "	12 00	705 68	1 00
Sunderland...	600	....	....	....	......	....	....	....

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1914, showing Cost per Year, Cost per Lamp, and Cost per Capita.

——	Population	No. of Arc Lights	Cost per Arc	Number of Incandescents	Size of Lamp	Cost per Incandescents	Total Cost	Cost per Capita
			$ c.			$ c.	$ c.	$ c.
Creemore.....	590	....	....	52	100-watt	12 50	....	..
Beachville....	501	....	....	43	100 "	10 00	430 00	86
Woodville	500	....	....	....	......	....	....	..
Rockwood	650	....	....	42	100-watt	13 00	549 50	87
Coldwater	609	....	....	44	100 "	12 00	528 00	88
Thamesford ..	400	....	....	29	100 "	14 00	372 16	93
Thorndale....	257	....	....	21	100 "	14 00	294 00	1 12

STATEMENT "F"

Cost per Kw-hr. of Domestic and Commercial Light, including Floor Space and Installed Capacity Charges; and Estimated Saving in 1914 to Hydro Light Users of Ontario Municipalities from Rate Reductions due to Hydro Service

Municipality	Service	Consumption Kw-hr.	Cost per Kw-hr.	Total Cost	Old Rate Kw-hr.	Cost of Present Consumption at Old Rate	Saving in Year's Use	Total Saving
				$ c.		$ c.	$ c.	$ c.
Toronto	Dom.	6,240,882	4.53	282,672 19	8. +25c.	558,820 56	276,148 37	908,060 58
	Com.	7,683,589	3.9	301,878 47	12. +25c.	933,790 68	631,912 21	
Hamilton ...	Dom.	1,856,627	4.	74,075 30	8. +25c.	168,810 16	94,734 86	164,630 14
	Com.	1,309,863	3.4	34,893 76	8.	104,789 04	69,895 28	
Ottawa.....	Dom.	1,376,353	5.	68,767 48	7.2+8.33	105,151 41	36,383 93	61,865 14
	Com.	1,061,263	4.9	51,769 72	7.2+8.33	77,250 93	25,481 21	
London.....	Dom.	1,192,000	4.8	57,473 08	9. +25c.	124,530 00	67,056 92	164,786 88
	Com.	1,580,000	3.	47,593 04	9. +25c.	145,323 00	97,729 96	
Brantford ..	Dom.	148,427	4.8	7,103 77	7.65+13.5	12,073 94	4,970 17	12,494 42
	Com.	166,469	3.6	5,392 87	7.65+13.5	12,917 12	7,524 25	
Berlin......	Dom.	359,307	4.9	17,757 08	10.8+25c.	43,305 15	25,548 07	68,347 66
	Com.	562,630	3.5	19,549 45	10.8+25c.	62,349 04	42,799 59	
St. Thomas.	Dom.	277,539	4.8	13,221 00	11.	30,529 29	17,308 29	41,996 88
	Com.	346,994	3.9	13,480 75	11.	38,169 34	24,688 59	
Stratford...	Dom.	269,459	5.5	15,180 91	12. +25c.	36,067 08	20,086 17	46,372 55
	Com.	345,639	4.7	16,336 30	12. +25c.	42,622 68	26,286 38	
Guelph.....	Dom.	286,032	5.9	16,920 54	8. +15c.	25,431 36	8,510 82	19,349 71
	Com.	325,080	4.9	15,923 51	8. +15c.	26,762 40	10,838 89	
St. Catharines	Dom.	53,572	3.7	2,013 49	7.	3,750 04	1,736 55	2,922 81
	Com.	22,843	1.8	412 75	7.	1,599 01	1,186 26	
Galt........	Dom.	300,121	5.3	15,797 16	11.	33,013 31	17,216 15	37,147 67
	Com.	289,857	4.1	11,952 75	11.	31,884 27	19,931 52	
Woodstock..	Dom.	169,054	5.2	8,807 40	8. +20c.	15,425 12	6,617 72	18,950 14
	Com.	289,982	4.	11,610 14	8. +20c.	23,942 56	12,332 42	
Barrie......	Dom.	152,095	7.3	11,149 49	9.	136,855 55	2,539 06	5,679 74
	Com.	138,948	6.8	9,464 64	9.	12,505 32	3,140 68	
Welland. ...	Dom.	117,328	3.7	4,411 20	8. +25c.	10,736 24	6,325 04	9,963 58
	Com.	64,449	2.6	1,676 38	8. +25c.	5,314 92	3,638 54	
Collingwood	Dom.	103.598	7.6	7,857 06	10. +15c.	11,286 80	3,429 74	8,608 60
	Com.	124,276	6.1	7,555 54	10. +15c.	12,834 40	5,178 86	
Midland....	Dom.	127,397	5.5	6,941 07	8.5+15c.	11,829 54	4,888 47	10,066 59
	Com.	117,741	4.3	5,048 06	8.5+15c.	10,226 18	5,178 12	
Ingersoll ...	Dom.	68,342	7.5	5,085 82	8. +25c.	6,508 36	1,422 54	4,143 94
	Com.	106,689	5.9	6,359 72	8. +25c.	9,081 12	2,721 40	
Preston	Dom.	108,257	6.	6,520 39	10. +18c.	12,072 02	5,551 63	11,549 26
	Com.	106,675	4.7	5,011 15	10. +18c.	11,008 78	5,997 63	
Dundas.....	Dom.	92,168	5.8	5,349 24	10. +25c.	10,566 80	5,217 56	19,442 92
	Com.	119,947	3.5	4,198 64	15. +25c.	18,424 00	14,225 36	
Goderich ...	Dom.	83,805	8.6	7,197 05	9.	7,542 45	345 40	2,618 71
	Com.	79,874	5.3	4,196 49	9.	6,469 80	2,273 31	
Waterloo...	Dom.	85,199	5.5	4,723 94	10.8+22.5	10,214 60	5,490 66	8,162 96
	Com.	98,924	5.	4,825 22	7.2+22.5	7,497 52	2,672 30	
Paris.......	Dom.	65,037	7.3	4,766 23	7. +10c.	4,912 59	146 56	2,877 11
	Com.	65,108	4.3	2,778 09	8. +20c.	5,508 64	2,730 55	
Penetang ...	Dom.	35,163	5.5	1,936 73	10. +25c.	3,936 30	1,999 57	7,085 44
	Com.	78,657	3.9	3,064 83	10. +25c.	8,150 70	5,085 87	
St. Mary's..	Dom.	67,375	6.7	4,614 95	9. +15c.	6,828 75	2,213 80	10,841 60
	Com.	145,257	3.3	4,733 33	9. +15c.	13,361 13	8,627 80	
Brampton ..	Dom.	142,178	4.9	6,798 89	9. +15c.	13,939 02	7,140 13	12,522 53
	Com.	101,751	4.	4,055 99	9. +15c.	9,438 39	5,382 40	
Tillsonburg.	Dom.	45,937	7.3	3,367 74	11. +25c.	5,893 07	2,525 33	7,005 11
	Com.	78,265	5.9	4,579 37	11. +25c.	9,059 15	4,479 78	
Hespeler....	Dom.	34,848	7.6	2,635 41	10. +15c.	3,844 80	1,209 39	3,016 54
	Com.	35,979	5.4	1,934 75	10. +15c.	3,741 90	1,807 15	

STATEMENT "F"—Continued

Cost per Kw-hr. of Domestic and Commercial Light, including Floor Space and Installed Capacity Charges; and Estimated Saving in 1914 to Hydro Light Users of Ontario Municipalities from Rate Reductions due to Hydro Service

Municipality	Service	Consumption Kw-hr	Cost per Kw-hr.	Total Cost	Old Rate Kw-hr.	Cost of Present Consumption at Old Rate	Saving in Year's Use	Total Saving
				$ c.		$ c.	$ c.	$ c.
Weston	Dom.	79,766	4.7	3,741 84	7.2+22.5	6,688 15	2,946 31	3,425 27
	Com.	26,774	.6	1,599 97	7.2+22.5	2,078 93	478 96	
Elmira	Dom.	20,875	9.5	1,968 41	11.4+10c.	2,559 75	591 34	1,878 39
	Com.	28,490	7.1	2,020 81	11.4+10c.	3,307 86	1,287 05	
Clinton	Dom.	21,466	9.4	2,023 70	10. +25c.	2,484 10	460 40	1,014 42
	Com.	24,696	8.2	2,028 08	10. +25c.	2,582 10	554 02	
Milton	Dom.	25,649	7.6	1,961 22	10.	2,564 90	603 68	2,478 38
	Com.	41,015	5.4	2,226 80	10.	4,101 50	1,874 70	
Georgetown	Dom.	42,328	7.2	3,069 02	10. +10c.	4,472 80	1,403 78	2,115 85
	Com.	29,544	8.	2,362 33	10. +10c.	3,074 40	712 07	
Seaforth	Dom.	37,453	6.8	2,467 36	10.8+18c.	4,476 82	2,009 46	4,181 36
	Com.	45,492	5.6	2,581 30	10. +17c.	4,753 20	2,171 90	
Mimico	Dom.	91,184	5.4	5,085 16	8. +25c.	8,651 68	3,566 52	3,566 52
	Com.	3,462	5.4	....	....	....	....	
New Hamburg	Dom.	23,010	7.7	1,779 90	10.	2,301 00	521 10	1,057 94
	Com.	19,404	7.2	1,403 56	10.	1,940 40	536 84	
Acton	Dom.	21,192	6.9	1,463 72	10.	2,119 20	655 48	1,147 10
	Com.	19,878	7.5	1,496 18	10.	1,987 80	491 62	
Norwich	Dom.	40,578	5.4	2,168 13	10. +15c.	4,387 20	2,219 07	2,927 91
	Com.	15,690	6.4	995 16	10. +15c.	1,704 00	708 84	
Caledonia*	Dom.	16,788	5.2	880 54	....	....	....	....
	Com.		5.2		....	....	....	....
Stayner	Dom.	9,200	9.9	909 58	....	....	....	....
	Com.	11,100	6.7	747 93	....	....	....	....
New Toronto*	Dom.	11,947	5.5	653 56	....	....	....	....
	Com.		5.5		....	....	....	....
Hagersville*	Dom.	16,053	5.4	1,222 33	....	....	....	....
	Com.	6,446	5.4		....	....	....	....
Pt. Credit*	Dom.	41,862	6.	2,461 42	....	....	....	....
	Com.		6.		....	....	....	....
Chesterville*	Dom.	7,672	6.9	530 13	....	....	....	....
	Com.	10,176	7.7	791 67	....	....	....	....
Waterdown*	Dom.	13,360	7.9	1,054 13	....	....	....	....
	Com.	8,321	6.5	535 83	....	....	....	....
Elmvale*	Dom.	6,856	9.9	673 18	....	....	....	....
	Com.	15,402	5.8	896 11	....	....	....	....
Baden*	Dom.	6,920	10.	1,247 81	....	....	....	....
	Com.	5,547	10.		....	....	....	....
Beachville*	Dom.	4,422	7.9	587 33	....	....	....	....
	Com.	2,988	7.9		....	....	....	....
Rockwood*	Dom.	7,824	8.8	....	....	....	....	....
	Com.	1,768	8.8	848 55	....	....	....	....
Coldwater*	Dom.	12,466	6.8	853 56	....	....	....	....
	Com.	10,382	5.7	589 85	....	....	....	....
Thamesford*	Dom.	3,686	10.9	393 49	....	....	....	....
	Com.	3,445	9,4	323 92	....	....	....	....
Thorndale*	Dom.	2,707	7.8	446 27	....	....	....	....
	Com.	2,989	7.8		....	....	....	....

NOTE—*No electric service prior to Hydro installation.

Average cost per Kw-hr., Domestic Light .... 4.8 ct.
" " " " Commercial Light.......................... 3.9 "

Approximate saving to Hydro Light users during the year, based on present consumption at old rates.......................... $1,694,300

STATE

Power Rates in

Municipality	Note	Cost of Power to Municipality per H.P. per Year 1912	1913	1914	1915	1912 Flat Rates 1st 10 H.P. per H.P. per Year	All Add'l per H.P. per Year	Differential 1st 10 H.P. per H.P. per Month	All Add'l per H.P. per Month	1st 50 Hr. per Month per Kw-hr.
		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	c.
Toronto	B	18 50	15 00	15 00	15 00	......	......	1 35	1 00	1.5
Hamilton	B	17 00	16 00	15 00	15 00	......	Special Schedule			
Ottawa	A	15 00	15 00	15 00	15 00	......	" "			
London	B	28 00	24 00	23 00	23 00	......	First Standard Schedule			
Brantford	B	......	......	19 50	19 50	......	......	......	......	......
Windsor	B	......	......	38 00	38 00	......	......	......	......	......
Peterboro	C & D	......	......	18 00	18 00	......	......	......	......	......
Berlin	B	25 00	22 50	21 50	21 50	......	First Standard Schedule			
Bridgeport, ext.	......	Served by Berlin				......	......	......	......	......
Port Arthur	A	20 30	19 50	22 25	*	Spec. Sched.		1 30	1 00	2.25
St. Thomas	B	32 00	29 00	28 00	28 00	......	First Standard Schedule			
Stratford	B	32 00	30 00	30 00	30 00		" " "			
Sebringville, ext.	......	Served by Stratford				......	......	......	......	......
Guelph	B	25 00	22 00	21 00	21 00	......	......	......		Special
St. Catharines	B	......	......	14 00	14 00	......	......	......	......	......
Galt	C	25 00	22 00	21 50	21 50	......	First Standard Schedule			
Woodstock	B	26 00	23 00	23 00	23 00	......	" " "			
Barrie	D	......	33 70	33 70	33 70	......	......	......	......	......
Welland	B	......	14 50	14 00	14 00	......	......	......	......	......
Port Robinson, ext.	......	Served by Welland				......	......	......	......	......
Collingwood	D	......	33 79	33 79	33 79	......	......	......	......	......
Midland	D	21 00	20 30	19 45	*	40 20	32 64	1 35	1 00	2.25
Ingersoll	B	28 00	25 50	25 50	25 50	......	First Standard Schedule			
Preston	C	25 00	21 50	21 00	21 00	......	" " "			
Dundas	B	17 00	16 00	15 00	15 00	......	" " "			
West Hamilton, ext.	......	Served by Dundas				......	......	......	......	......
Ancaster, ext.	......	" " "				......	......	......	......	......
Bullock's Corners and Greensville, ext.	......	" " "				......	......	......	......	......
Goderich	B	......	......	37 00	37 00	......	......	......	......	......
Waterloo	B	26 00	23 50	22 50	22 50	......	First Standard Schedule			
Walkerville	B	......	......	38 00	38 00	......	......	......	......	......
Paris	B	......	......	21 00	21 00	......	......	......	......	......
Penetang	D	28 80	26 50	26 50	26 50	40 20	32 64	1 35	1 00	2.25
St. Mary's	B	38 00	29 50	29 50	29 50	......	First Standard Schedule			
Brampton	B	29 00	25 00	25 00	25 00	......	......	1 35	1 00	3.3
Tillsonburg	B	32 00	32 00	32 00	32 00	......	......	1 35	1 00	3
Hespeler	C	26 00	23 00	23 00	23 00		First Standard Schedule			
Prescott	D	......	......	39 59	*	......	......	......	......	......
Weston	B	30 00	30 00	30 00	30 00	......	......	1 35	1 00	3.3
Scarlett Road, ext.	......	Served by Weston				......	......	......	......	......
Elmira	D	......	38 00	38 00	38 00	......	......	......	......	......
Clinton	B	......	......	41 00	41 00	......	......	......	......	......
Milton	B	......	28 00	28 00	28 00	......	......	......	......	......
Georgetown	D	......	36 00	36 00	36 00	......	......	......	......	......
Glen Williams, ext.	......	Served by Georgetown				......	......	......	......	......
Seaforth	B	41 00	40 00	40 00	40 00	......	......	1 35	1 00	4.4
Mimico	D	30 74	30 00	30 00	30 00	......	......	1 35	1 00	3.6
Humber Bay, ext.	......	Served by Mimico				......	......	......	......	......
Mitchell	B	38 00	37 00	37 00	37 00	......	First Standard Schedule			
New Hamburg	D	32 00	32 00	32 00	32 00	......	" " "			

MENT "G"

Municipalities

1912			1913					1914				
Rates												
2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Service Charge per H.P. per Month	1st 50 Hr. per Month per Kw-hr.	2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Service Charge per H.P. per Month	1st 50 Hr. per Month per Kw-hr.	2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount
c.	c.	%	$ c.	c.	c.	c.	%	$ c.	c.	c.	c.	%
1.0	0.5	10to20		Same as 1912					Same as 1912			
......	......	......	1 00	2.1	1.4	0.2	25 & 10	1 00	2.1	1.4	0.2	25 & 10
......	......	......		Special Schedule				1 00	1.8	1.2	0.15	20
10% local dis.		10	Same as	1912	......	......	......	1 00	2.5	1.7	0.2	10
......	......	......	......	......	......	......	......	1 00	1.9	1.3	0.15	10
......	......	......	......	......	......	......	......	1 00	3.6	2.4	0.3	10
......	......	......	......	......	......	......	......	1 00	1.3	0.8	0.1	10 & 10
10% local dis.		10	1 00	2.5	1.7	0.2	10	1 00	2.1	1.4	0.2	10
......	......	......	......	......	......	......	......	......	......	......	......	......
1.75	1	10		Same as 1912				1 00	2.	1.3	0.15	10
no local disc.		10	1 00	3.3	2.0	0.3	10	1 00	2.5	1.7	0.2	10
"	"	10	1 00	3.6	2.4	0.3	10	1 00	3.6	2.4	0.3	10
......	......	......	1 00	5.4	3.6	0.4	10	1 00	5.4	3.6	0.4	10
Schedule		......	1 00	2.3	1.6	0.2	25	1 00	2.	1.5	0.2	25
......	......	......	......	......	......	......	......	1 00	1.8	1.2	0.15	25
10% local dis.		10	1 00	2.3	1.6	0.2	25	1 00	1.9	1.3	0.15	25
"	"	10	1 00	2.5	1.7	0.2	10	1 00	2.	1.5	0.2	10
......	......	......	1 00	3.6	2.4	0.3	10	1 00	3.6	2.4	0.3	10
......	......	......	1 00	1.8	1.2	0.15	25	1 00	1.8	1.2	0.15	25
......	......	......	1 00	1.8	1.2	0.15	10	1 00	1.8	1.2	0.15	10
......	......	......	1 00	3.6	2.4	0.3	10	1 00	3.6	2.4	0.3	10
1.5	0.75	10	1 00	1.7	1.1	0.15	10	1 00	1.7	1.1	0.15	10
no local disc.		10	1 00	3.3	2.0	0.3	10	1 00	3.3	2.0	0.3	10
10%	"	10	1 00	2.3	1.6	0.2	10	1 00	2.3	1.6	0.2	20
33⅓%	"	10	1 00	1.6	1.1	0.15	15	1 00	1.6	1.1	0.15	15
......	......	......	1 00	2.8	1.8	0.2	10	1 00	2.8	1.8	0.2	10
......	......	......	......	......	......	......	......	1 00	3.	2	0.25	10
......	......	......	1 00	2.8	1.8	0.25	10	1 00	2.8	1.8	0.25	10
......	......	......	......	......	......	......	......	1 00	4.8	3.2	0.4	10
10% local dis.		10	1 00	2.5	1.7	0.2	10	1 00	2.5	1.7	0.2	25
......	......	......	......	......	......	......	......	1 00	3.6	2.4	0.3	10
......	......	......	......	......	......	......	......	1 00	2.5	1.7	0.2	10
1.5	0.75	10	1 00	1.7	1.1	0.15	10	1 00	1.7	1.1	0.15	10
no local disc.		10	1 00	3.6	2.4	0.3	10	1 00	3.6	2.4	0.3	10
2.2	0.3	10	1 00	3	2	0.25	10	1 00	2.8	1.8	0.2	10
2	1	10	1 00	3.8	2.5	0.3	10	1 00	3.8	2.5	0.3	10
no local disc.		10	1 00	3	2	0.25	10	1 00	3.	2	0.25	10
......	......	......	......	......	......	......	......	1 00	2.8	1.8	0.2	10
2.2	0.3	10	1 00	3.3	2.2	0.3	10	1 00	3.	2	0.2	10
......	......	......	......	......	......	......	......	1 00	3.3	2.2	0.3	10
......	......	......	1 00	4.7	3.1	0.4	10	1 00	4.7	3.1	0.4	10
......	......	......	......	......	......	......	......	1 00	4.9	3.3	0.4	10
......	......	......	1 00	3.1	2.1	0.3	10	1 00	3.	2	0.25	10
......	......	......	1 00	4.3	2.9	0.4	10	1 00	4.	2.7	0.3	10
......	......	......	......	......	......	......	......	1 00	4.3	2.9	0.4	10
2.5	1.25	10	1 00	4.9	3.3	0.4	10	1 00	4.3	2.9	0.4	10
2.4	0.3	10	1 00	3.6	2.4	0.3	10	1 00	3.3	2.2	0.3	10
......	......	......	......	......	......	......	......	1 00	3.6	2.4	0.3	10
no local disc.		10	1 00	4.7	3.1	0.4	10	1 00	4.2	2.8	0.3	10
"	"	10	1 00	4.2	2.8	0.3	10	1 00	3.8	2.5	0.3	10

STATEMENT

Power Rates in

Municipality	Note	Cost of Power to Municipality per H.P. per Year 1912	1913	1914	1915	1912 Flat Rates: 1st 10 H.P. per H.P. per Year	All Add'l per H.P. per Year	1912 Differential: 1st 10 H.P. per H.P. per Month	All Add'l per H.P. per Month	1st 50 Hr. per Month per Kw-hr.
		$ c.	$ c.	$ c.	$ c.			$ c.	c.	c.
Acton	D	......	36 00	36 00	36 00	......	......	......	......	......
Fergus	D	......	......	33 97	33 97	......	......	......	......	......
Norwich	D	30 00	32 00	32 00	32 00	......	......	1 35	1 00	3.5
Elora	D	......	......	33 97	33 97	......	......	......	......	......
Port Dalhousie	D	......	22 30	21 42	*	......	......	......	......	......
Caledonia	D	29 10	29 10	24 00	24 00	......	......	1 35	1 00	3.7
Winchester	D	......	......	38 28	*	......	......	......	......	......
Stayner	D	......	......	37 82	*	......	......	......	......	......
Beaverton	D	......	......	......	*	......	......	......	......	......
New Toronto	D	......	......	28 00	28 00	......	......	......	......	......
Hagersville	D	......	33 21	33 21	33 21	......	......	......	......	......
Port Credit	D	36 79	31 00	28 00	28 00	......	......	1 35	1 00	3.7
Cannington	D	......	......	......	*	......	......	......	......	......
Port Stanley	D	59 75	55 50	43 85	*	......	......	1 35	1 00	5.5
Chesterville	D	......	......	36 12	*	......	......	......	......	......
Waterdown	D	37 50	26 00	26 00	26 00	......	......	1 35	1 00	3.5
Elmvale	D	......	31 00	31 00	31 00	......	......	......	......	......
Baden	D	36 95	37 00	32 00	32 00	......	......	1 35	1 00	4.5
St. Agatha and Petersburg ext.	......		Served	by Ba	den	......	......	......	......	......
Streetsville	D	......	......	26 00	26 00	......	......	......	......	......
Sunderland	D	......	......	......	*	......	......	......	......	......
Creemore	D	......	......	54 13	54 13	......	......	......	......	......
Beachville	D	33 89	31 00	31 00	31 00	......	......	1 35	1 00	3.9
Woodville	D	......	......	......	*	......	......	......	......	......
Rockwood	D	......	38 00	38 00	38 00	......	......	......	......	......
Coldwater	D	......	28 00	28 00	28 00	......	......	......	......	......
Thamesford	D	......	......	45 00	45 00	......	......	......	......	......
Thorndale	D	......	......	45 00	45 00	......	......	......	......	......

* Rate based on load characteristics and determined at end of year.

Note A—Power delivered at 26,400 or 22,000 volts.
Note B—Power delivered at 13,200 or 12,000 volts.
Note C—Power delivered at 6,600 volts.
Note D—Power delivered at 2,300 or 4,000 volts.

"G"—Continued

Municipalities

1912 Rates			1913					1914				
2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Service Charge per H.P. per Month	1st 50 Hr. per Month per Kw-hr.	2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Service Charge per H.P. per Month	1st 50 Hr. per Month per Kw-hr.	2nd 50 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount
c.	c.	%	$ c.	c.	c.	c.	%	$ c.	c.	c.	c.	%
......	......	......	1 00	4.3	2.9	0.4	10	1 00	4.3	2.9	0.4	10
......	......	......	......	......	......	......	......	1 00	3.9	2.6	0.3	10
2.3	0.3	10	1 00	3.5	2.3	0.3	10	1 00	3.	2	0.25	10
......	......	......	......	......	......	......	......	1 00	3.9	2.6	0.3	10
......	......	......	1 00	2.1	1.4	0.2	10	1 00	2.1	1.4	0.2	10
2.5	0.3	10	1 00	3.7	2.5	0.3	10	1 00	3.7	2.5	0.3	10
......	......	......	......	......	......	......	......	1 00	3.1	2.0	0.25	10
......	......	......	1 00	4.7	3.1	0.4	10	1 00	4.2	2.8	0.3	10
......	......	......	......	......	......	......	......	1 00	3.6	2.4	0.3	10
......	......	......	......	......	......	......	......	1 00	3.	2.	0.25	10
......	......	......	1 00	3.9	2.6	0.3	10	1 00	3.9	2.6	0.3	10
2.4	0.3	10	1 00	3.7	2.4	0.3	10	1 00	3.	2	0.25	10
......	......	......	......	......	......	......	......	1 00	3.6	2.4	0.3	10
3.7	0.5	10	1 00	5.5	3.7	0.5	10	1 00	5..	3.	0.4	10
......	......	......	......	......	......	......	......	1 00	4.2	2.8	0.3	10
2.4	0.3	10	1 00	3.5	2.4	0.3	10	1 00	3.5	2.4	0.3	10
......	......	......	1 00	3.6	2.4	0.3	10	1 00	3.6	2.4	0.3	10
3.0	0.4	10	1 00	4.5	3.0	0.4	10	1 00	3.8	2.5	0.3	10
......	......	......	1 00	5.1	3.4	0.4	10	1 00	5.1	3.4	0.4	10
......	......	......	......	......	......	......	......	1 00	3.4	2.2	0.3	10
......	......	......	......	......	......	......	......	1 00	4.5	3.0	0.4	10
......	......	......	......	......	......	......	......	1 00	6.4	4.3	0.5	10
2.6	0.3	10	1 00	3.9	2.6	0.3	10	1 00	3.	2	0.25	10
......	......	......	......	......	......	......	......	1 00	4.5	3.0	0.4	10
......	......	......	1 00	4.7	3.1	0.4	10	1 00	4.7	3.1	0.4	10
......	......	......	1 00	3.2	2.1	0.3	10	1 00	3.2	2.1	0.3	10
......	......	......	......	......	......	......	......	1 00	5.6	3.8	0.5	10
......	......	......	......	......	......	......	......	1 00	5.6	3.8	0.5	10

Suggested Rates for 1915

Toronto, 1st 10 H.P.	1.35	......	......	......	......
" All additional	1.00	1.5	1.	0.15	20
Hamilton	1.00	1.9	1.3	0.15	25 & 10
London	1.00	2.5	1.7	0.2	10 & 10
St. Thomas	1.00	2.5	1.7	0.2	10 & 10
Guelph	1.00	2.	1.5	0.2	25 & 10
Woodstock	1.00	2.	1.5	0.2	10 & 10
Preston	1.00	2.3	1.6	0.2	20 & 10
Waterloo	1.00	2.5	1.7	0.2	25 & 10
Georgetown	1.00	3.5	2.3	0.3	10
New Hamburg	1.00	3.8	2.5	0.3	10 & 10
Rockwood	1.00	4.7	3.1	0.4	10 & 10

All other Municipalities same Rates as in 1914

STATE

Lighting Rates

Municipality	1912					1913				
	Domestic		Commercial			Domestic		Commercial		
	Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount
	c.	c.	c.	c.	%	c.	c.	c.	c.	%
Toronto	4	3	8	3	10–20	4	3	8	3	10–20
Hamilton	4	3	8	3	10	4	3	{6-1st 25 hr. {3-next 75 hr.	0.2	20
Ottawa	Special Schedule						Special Schedule			
London	...	5	5	5	10	...	5	5	5	10
Brantford	...	...	...	...	...	...	...	...	...	...
Windsor	...	...	...	...	...	...	...	...	...	...
Peterboro'	...	...	...	...	...	...	...	...	...	...
Berlin	5	4	12	5	10	4	4	8	4	10
Bridgeport, ext.	Berlin rate + 10%					Berlin rate + 10%				
Port Arthur	4	3.5	8	3.5	10	4	3.5	8	3.5	10
St. Thomas	3	5	12	5	10	4	4	8	4	10
Stratford	4	4.5	12	4.5	10	4	4.5	9	4.5	10
Sebringville, ext.	...	...	...	...	...	4	5	10	5	10
Guelph	...	8	8	8	net	4	4	8	4	20
St. Catharines	...	...	...	...	...	...	...	...	...	...
Galt	4	4	12	4	25	4	4	8	4	25
Woodstock	3	4	10	4	20	4	4	8	4	25
Barrie	...	...	...	...	...	4	4.5	9	4.5	10
Welland	...	...	...	...	...	4	3	6	3	25
Port Robinson, ext.	...	...	...	...	...	4	3	6	3	10
Collingwood	...	...	...	...	...	4	4.5	9	4.5	10
Midland	4	4	12	4	10	4	4	8	4	20
Ingersoll	...	10	10	10	10	4	4.5	9	4.5	10
Preston	4	4.5	12	4.5	10	4	4	8	4	10
Blair & Doon, ext.	...	...	...	...	...	...	...	...	...	...
Dundas	4	3.5	10	3.5	10	4	3	{6-1st 25 hr. {3-next 75 hr.	0.15	10
West Hamilton, ext.	...	...	...	...	...	4	4	8	4	10
Ancaster, ext.	...	...	...	...	...	...	...	...	...	...
Bullock's Corners and Greensville, ext.	...	...	...	...	...	4	4	8	4	10
Goderich	...	...	...	...	...	...	...	...	...	...
Waterloo	4	4	12	4	10	4	4	8	4	20
Walkerville	...	...	...	...	...	...	...	...	...	...
Paris	...	...	...	...	...	...	...	...	...	...
Penetang	4	5	12	5	10	4	4	8	4	10
St. Mary's	4	6	12	7	10	4	5	10	5	10
Brampton	...	6	6	6	20	4	3	6	3	10
Tillsonburg	4	5	12	5	10	4	5	10	5	10
Hespeler	...	10	10	10	10	4	4.5	9	4.5	10
Prescott	...	...	...	...	...	...	...	...	...	...

MENT "H"

in Municipalities

1914					Suggested 1915						
Domestic		Commercial			Domestic			Commercial			
Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Per 100 Sq. Ft.	Note A per Kw-hr.	Note B per Kw-hr.	1st 30 Hr. per Kw-hr.	Next 70 hr per Kw-Hr.	All Additional per Kw-hr.	Prompt Payment Discount
c.	c.	c.	c.	%	c.	c.	c.	c.	c.	c.	%
4	3	8	3	10–20	3	2.8	1.4	6	2.8	0.6	10
4	3	6-1st 25 hr. 3-next 75 hr.	0.2	20	3	2.5	1.25	5	2.5	0.2	10
4	2.5	6	2.5	20	3	2.2	1.1	5	2.2	0.5	10
4	3	6	3	25	3	2	1	5	2	0.5	10
4	3	6-1st 30 hr. 3-next 70 hr.	0.15	10	3	3	1.5	6	3	0.15	10
3	4	8-1st 30 hr. 4-next 70 hr.	0.8	10	3	4	2	8	4	0.8	10
3	2.5	6	2.5	10	3	2.5	1.25	5	2.5	0.5	10
4	4	8	4	25	3	2.5	1.25	5	2.5	0.5	10
Berlin rate + 10%											
4	2.5	6	2.5	10	3	2	1	5	2	.5	10
4	2.5	6	2.5	20	3	2	1	5	2	.5	10
4	4	8	4	20	3	3	1.5	6	3	.6	10
4	5	10	5	10	3	5	2.5	10	5	1	10
4	4	8	4	25	3	2.25	1.125	5	2.25	0.5	10
4	3	6-1st 30 hr. 3-next 70 hr.	0.6	25	3	2.25	1.125	5	2.25	0.5	10
3	2.5	6	2.5	10	3	2.5	1.25	5	2.5	0.5	10
4	3	6	3	20	3	2.5	1.25	5	2.5	0.5	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	3	6	3	25	3	2.25	1.125	5	2.25	0.15	10
4	3	6	3	10	3	3	1.5	6	3	0.6	10
4	4.5	9	4.5	10	3	4	2	8	4	2	10
4	3	6	3	10	3	2.5	1.25	5	2.5	0.5	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
4	4	8	4	20	3	3	1.5	6	3	0.6	10
4	5.5	8	5.5	10							
4	3	6-1st 25 hr. 3-next 75 hr.	0.15	10	3	2.5	1.25	5	2.5	0.15	10
4	4	8	4	10	3	4	2	8	4	0.8	10
4	5	10	5	10	3	5	2.5	10	5	1	10
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	4	8	4	25	3	3	1.5	6	3	0.6	10
3	4	8-1st 30 hr. 4-next 70 hr.	0.8	10	3	4	2	8	4	0.8	10
4	3.5	7	3.5	10	3	3.5	1.75	7	3.5	0.7	10
4	3	6	3	10	3	3	1.5	6	3	0.6	10
4	5	10	5	10	3	4.5	2.25	9	4.5	0.9	10
4	3	6	3	20	3	2.5	1.25	5	2.5	0.5	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
4	4.5	9	4.5	10	3	4	2	8	4	0.8	10
4	4	8	4	10	3	4	2	8	4	0.8	10

NOTE A—For all consumption up to 4 kw-hr. per month per 100 sq. ft. of floor area for the first 1000 sq. ft. and 3 kw-hr. for each additional 100 sq. ft. of floor area charged.

NOTE B—For all additional consumption.

STATEMENT

Lighting Rates

Municipality	1912					1913				
	Domestic		Commercial		Prompt Payment Discount	Domestic		Commercial		Prompt Payment Discount
	Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Month per Kw-hr.	All Additional per Kw-hr.		Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Month per Kw-hr.	All Additional per Kw-hr.	
	c.	c.	c.	c.	%	c.	c.	c.	c.	%
Weston	......	8	8	8	10	4	4	8	4	10
Scarlet Road, ext.	......	......	......	......	......	......	......	......	......	......
Elmira	......	......	......	......	......	4	5	10	5	10
Clinton	......	......	......	......	......	......	......	......	......	......
Milton	......	......	......	......	......	4	4	8	4	10
Georgetown	......	......	......	......	......	4	5	10	5	10
Glen Williams, ext	......	......	......	......	......	......	......	......	......	......
Seaforth	......	10	10	10	5 to 20	4	5	10	5	10
Mimico	4	4.5	12	4.5	10	4	4	9	4.5	10
Humber Bay ext.	......	......	......	......	......	......	......	......	......	......
Mitchell	Special rates 70c. per month minimum					......		......	......	......
New Hamburg	......	10	10	10	10	4	5	10	5	10
Acton	......	......	......	......	......	4	5	10	5	10
Fergus	......	......	......	......	......	......	......	......	......	......
Norwich	4	4	12	4	10	4	4	8	4	10
Elora	......	......	......	......	......	......	......	......	......	......
Port Dalhousie	......	......	......	......	......	4	3	6 also flat rates	3	10
Caledonia	4	4	10	4	10	4	4	8	4	10
Winchester	......	......	......	......	......	......	......	......	......	......
Stayner	......	......	......	......	......	4	5	10	5	10
Beaverton	......	......	......	......	......	......	......	......	......	......
New Toronto	......	......	......	......	......	......	......	......	......	......
Hagersville	......	......	......	......	......	4	4.5	9	4.5	10
Port Credit	4	4.5	12	4.5	10	4	4.5	9	4.5	10
Cannington	......	......	......	......	......	......	......	......	......	......
Port Stanley	4	5	12	5	10	4	5	10	5	10
Chesterville	......	......	......	......	......	......	......	......	......	......
Waterdown	4	5	12	5	10	4	5	10	5	10
Elmvale	......	......	......	......	......	4	4.5	9	4.5	10
Baden	4	5	12	5	10	4	5	10	5	10
St. Agatha and Petersburg ext.	......	......	......	......	......	4	6	12	6	10
Sunderland	......	......	......	......	......	......	......	......	......	......
Creemore	......	......	......	......	......	......	......	......	......	......
Beachville	4	5	12	5	10	4	5	10	5	10
Woodville	......	......	......	......	......	......	......	......	......	......
Rockwood	......	......	......	......	......	4	4.5	11	4.5	10
Coldwater	......	......	......	......	......	4	4	8	4	10
Thamesford	......	......	......	......	......	......	......	......	......	......
Thorndale	......	......	......	......	......	......	......	......	......	......

"H"—Continued

in Municipalities

1914					Suggested 1915						
Domestic		Commercial			Domestic			Commercial			
Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount	Per 100 Sq. Ft.	Note A per Kw-hr.	Note B per Kw-hr.	1st 30 Hr. per Kw-hr.	Next 70 Hr. per Kw-hr.	All Additional per Kw-hr.	Prompt Payment Discount
c.	c.	c.	c.	%	c.	c.	c.	%	c.	c.	%
4	3	6	3	10	3	3	1.5	6	3	0.6	10
4	4	8	4	10							
4	5	10	5	10	3	45	2.25	9	4.5	0.9	10
4	5	10	5	10	3	5	2.5	10	5	1	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
4	5	10	5	10	3	4	2	8	4	0.8	10
4	6	12	6	10							
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
4	5	10	5	10							
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
4	5	10	5	10	3	5	2.5	10	5	1	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	4	8	4	15	3	3.5	1.75	7	3.5	0.7	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	3	6	3	10	3	3	1.5	6	3	0.6	10
	also flat rates						also flat rates				
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
3	4	8	4	10	3	4	2	8	4	0.8	10
4	4	8	4	10	3	4	2	8	4	0.8	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	4	8	4	10	3	3.5	1.75	7	3.5	0.7	10
3	4	8	4	10	3	4	2	8	4	0.8	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	5	10	5	10	3	5	2.5	10	5	1	10
4	5	10	5	10	3	4.5	2.25	9	4.5	0.9	10
4	4.5	9	4.5	10	3	4.5	2.25	9	4.5	0.9	10
4	4.5	9	4.5	10	3	4	2	8	4	0.8	10
4	6	12	6	10	3	6	3	12	6	1.2	10
3	6	12	6	10	3	6	3	12	6	1.2	10
4	7	14	7	10	3	7	3.5	14	7	1.4	10
4	5	10	5	10	3	4.5	2.25	9	4.5	0.9	10
3	6	12	6	10	3	6	3	12	6	1.2	10
4	4.5	11	4.5	10	3	4.5	2.5	9	4.5	0.9	10
4	4	8	4	10	3	4	2	8	4	0.8	10
4	6	12	6	10	3	5	2.5	10	5	1.0	10
4	6	12	6	10	3	6	3	12	6	1.2	10

Note A—For all consumption up to 4 kw-hr. per month per 100 sq. ft. of floor area for the first 1000 sq. ft., and 3 kw-hr. for each additional 100 sq. ft. of floor area charged.

Note B—For all additional consumption.

MUNICIPAL RATES

Beginning with the past fiscal year all of the municipalities under the control of the Commission adopted rates in accordance with the standard schedules that had been developed. A brief description of the form of these schedules applied to the urban municipalities and their suburbs which have been more fully outlined in the previous reports, may be given as follows:

Domestic Lighting

A service charge of 4 cents per month per 100 square feet of floor area, with a minimum charge of 25 cents, and a varying consumption charge, based on the cost of power to the municipality, and a prompt payment discount, which is also varied in different municipalities, according to local conditions.

Commercial Lighting

A charge per kilowatt-hour of twice the domestic lighting consumption charge, for the first 30 hours monthly use of the installed capacity, while all remaining consumption is billed at one-half of that rate, with a prompt payment discount which is varied in different localities, according to local conditions, and a minimum monthly bill of 50 cents. There is no service charge for commercial lighting.

Power

A service charge of $1.00 per month per horse power of connected load, or maximum demand, and three consumption charges, varied according to the cost of power to the municipality, having the approximate ratio of 12 to 8 to 1 for the first 50 hours of monthly use of load, for the second 50 hours monthly use and for all additional consumption, with a prompt payment discount which is also varied according to local conditions, and with class discounts, that are the same in all municipalities.

Street Lighting

A rate per lamp per year based on the actual cost of service, according to the size and style of street lighting unit used.

The "Standard Interpretations of Rates" contained in this section, were prepared and circulated among the municipalities for their guidance.

Referring to the tabulation of the rates in use in the municipalities, it will be noted that there are prompt payment discounts of from 10 per cent to 25 per cent. There is one municipality where 25 per cent plus 10 per cent is given to power consumers. The former discount in this case is, however, used as a local discount, and is never recharged for non-payment of bills.

With the use of this wide range of prompt payment discounts there is a great variation in the net service charges for domestic lighting in different municipalities. In some cases this rate is 3.6 cents per 100 square feet of floor area, while in others, only 3 cents per 100 square feet is collected. To investigate the advisability of enforcing a uniform charge in all municipalities, data was collected from over thirty operating towns, giving details as to the floor area and the consumption of each consumer. After investigating the costs of serving different sized houses in different municipalities, it was decided that the service charge for domestic lighting be changed to:—3 cents per month per 100 square feet of floor area, with a minimum charge on 1,000 square feet in cities and towns, or 1,200 square feet in villages and police villages or 1,500 square feet in suburban districts, and a maximum service charge on 3,000 square feet.

It was also decided that the prompt payment discount on domestic lighting bills be 10 per cent in all municipalities.

Calculations were then made to ascertain the changes that would be required in the consumption charges of the municipalities with the application of the 3 cent service charge, and the 10 per cent prompt payment discount, to produce desired amounts of revenue.

A further analysis was made to ascertain the advisability of fixing a follow-up rate for domestic consumers having large consumptions, due to the use of electric stoves and other appliances of large capacity. It was decided that consumption charges corresponding to those at present in use will apply to all consumption up to 40 kw-hr. per month for the first 1,000 square feet, and 3 kw-hr. for each additional 100 square feet of floor area charged. All additional consumption is to be billed at one-half of this rate.

Although the standard schedule of rates for commercial lighting is in accordance with the description given above, there are a few isolated cases where municipalities have been allowed to use a third charge, applying to all consumption over 100 hours use per month of the installed capacity. These charges have been the same as the third consumption charge of the power rate used in those municipalities. Since with the present standard consumers taking long hour service are required to pay larger bills than would be the case if they were billed at the power rates, it was decided that a third consumption charge be put into force in all municipalities, and that it be made one-tenth of the consumption charge for the first 30 hours monthly use, and apply to all power taken over 100 hours use.

It was also decided that the commercial lighting rates be adjusted so that a uniform discount of 10 per cent would apply in all municipalities.

These decisions in regard to both the Domestic and Commercial lighting rates will be incorporated into the recommendations as to rates for use during 1915.

No radical changes are contemplated in the form of the power rate schedules at present in use. In some of these, however, it will be noted that the prompt payment discount is large, being 25 per cent in a few cases. This amount makes too great a penalty for non-payment of bills, 10 per cent being deemed sufficient. It has, therefore, been decided that whenever a prompt payment discount of over 10 per cent exists, and it is deemed advisable to make a reduction in the power schedule, a local discount shall be given, or the rate schedule changed so as to give the desired reduction with the use of the minimum cash discount.

Municipal Rates

1914

Municipality	Cost of Power to Municipality per H.P. per Year	Lighting Rates: Domestic Per 100 Sq. Ft.	Lighting Rates: Domestic Per Kw-hr.	Lighting Rates: Commercial 1st 30 Hr. per Kw-hr.	Lighting Rates: Commercial All Add'l per Kw-hr.	Lighting Rates: Prompt Payment Discount	Power Rates: Per H.P. per Month	Power Rates: 1st 50 Hr. per Month per Kw-hr.	Power Rates: 2nd 50 Hr. per Month per Kw-hr.	Power Rates: All Add'l per Kw-hr.	Power Rates: Prompt Payment Discount	Street Lighting
	$ c.	c.	c.	c.	c.	%	$ c.	c.	c.	c.	%	$ c.
Acton	36 00	4	5	10	5	10	1 00	4.3	2.9	0.4	10	15.00 per 100-w. Incan.
Ancaster	Served by Dundas	4	5	10	5	10	1 00	3	2	0.25	10	14.00 " "
Baden	32 00	4	4.5	9	4.5	10	1 00	3.8	2.5	0.3	10	12.00 " "
Barrie	33 70	4	4.5	9	4.5	10	1 00	3.6	2.4	0.3	10	12.00 " "
Beachville	31 00	4	5	10	5	10	1 00	3	2	0.25	10	10.00 " "
Beaverton	Note A	3	4	8	4	10	1 00	3.6	2.4	0.3	10	13.00 " "
Berlin	21 50	4	3.5	7	3.5	25	1 00	2.1	1.4	0.2	10	9.00 " "
Brampton	25 00	4	3	6	3	20	1 00	2.8	1.8	0.2	10	8.00 " "
Brantford	19 50	4	3	6c. 1st 30 hr. 3c. next 70 hr.	0.15	10	1 00	1.9	1.3	0.15	10	8.00 " " 40.00 Magnetite Arc.
Bullock's Corn. and Greensville	Served by Dundas	4	4	8	4	10	1 00	2.8	1.8	0.25	10	12.00 100-w. Incan.
Caledonia	24 00	4	4	8	4	10	1 00	3.7	2.5	0.3	10	12.00 100-w. "
Cannington	Note A	3	4	8	4	10	1 00	3.6	2.4	0.3	10	13.00 " "
Chesterville	44 43	4	5	10	5	10	1 00	4.2	2.8	0.3	10	13.00 " "
Clinton	41 00	4	5	10	5	10	1 00	4.9	3.3	0.4	10	12.50 40-c.p. "
Coldwater	28 00	4	4	8	4	10	1 00	3.2	2.1	0.3	10	12.00 100-w. "
Collingwood	33 97	4	4.5	9	4.5	10	1 00	3.6	2.4	0.3	10	12.00 " "
Creemore	54 00	4	7	14	7	10	1 00	6.4	4.3	0.5	10	12.50 " "
Dundas	15 00	4	3	6c. 1st 25 hr. 3c. next 75 hr.	0.15	10	1 00	1.6	1.1	0.15	15	9.00 " "
Elmira	38 00	4	5	10	5	10	1 00	4.7	3.1	0.4	10	12.00 " "
Elmvale	31 00	4	4.5	9	4.5	10	1 00	3.6	2.4	0.3	10	12.00 " "
Elora	33 97	4	4.5	9	4.5	10	1 00	3.9	2.6	0.3	10	12.50 " "
Fergus	33 97	4	4.5	9	4.5	10	1 00	3.9	2.6	0.3	10	12.50 " "
Galt	21 50	3	2.5	6	2.5	10	1 00	1.9	1.3	0.15	25	8.50 " "

Georgetown ..	36 00	4	5	10	5	10	1 00	4	2.7	0.3	10	12.50	100-w. Incan.
Glen Williams	Served by Georget'n	4	6	12	6	10	1 00	4.3	2.9	0.4	10	14.00	100-w "
Goderich	37 00	4	4.5	9	4.5	10	1 00	4.8	3.2	0.4	10	15.00 55.00 40.00 25.00	80-c.p. " 3-lt. Standard 1 " 1 "
Guelph	21 00	4	4	8	4	25	1 00	2	1.5	0.2	25	9.00	100-w.Incan.
Hagersville ...	33 21	4	4.5	9	4.5	10	1 00	3.9	2.6	0.3	10	12.00	" "
Hamilton.....	15 00	4	3	6c. 1st 25 hr. 3c. next 75 hr.	0.2	20	1 00	2.1	1.4	0.2	25 & 10	8.00 13.75 50.00	" " 250-w. " 500-w. Nitrogen-filled on Stand.
Hespeler	23 00	4	4.5	9	4.5	10	1 00	3	2	0.25	10	12.00	100-w. Incan.
Ingersoll	25 50	4	4	8	4	10	1 00	2.8	1.8	0.2	10	12.00 12.50	80-w. " 100-w. "
London.......	23 00	4	3	6c. 1st 30 hr. 3c. next 70 hr.	0.6	25	1 00	2.5	1.7	0.2	10	11.00 12.85	75-w. " 100-w. "
Midland......	19 45	4	3	6	3	10	1 00	1.7	1.1	0.15	10	13.50 35.00	" " 500-w. Arc.
Milton	28 00	4	4	8	4	10	1 00	3	2	0.25	10	9.00	100-w. Incan.
Mimico.......	30 00	4	4	8	4	10	1 00	3.3	2.2	0.3	10	11.00	" "
Mitchell	37 00	4	4	8	4	10	1 00	4.2	2.8	0.3	10	12.00	" "
New Hamburg	32 00	4	4	8	4	10	1 00	3.8	2.5	0.3	10	9.00	" "
New Toronto..	28 00	4	4	8	4	10	1 00	3	2	0.25	10	12.00	" "
Norwich......	32 00	4	4	8	4	15	1 00	3	2	0.25	10	12.00 9.00 10.00	" " 60-w. " 100-w. "
Ottawa.......	15 00	4	2.5	6	2.5	20	1 00	1.8	1.2	0.15	20	45.00	Arc
Paris	21 00	4	3.5	7	3.5	10	1 00	2.5	1.7	0.2	10	11.00	100-c.p. Incan.
Penetang	26 50	4	3	6	3	10	1 00	1.7	1.1	0.15	10	12.00	100-w. "
Peterboro'	18 00	3	2.5	6	2.5	10	1 00	1.3	0.8	0.1	10 & 10	12.00 50.00 50.50	16 & 32-c.p.Incan. 500-w. Arc. Magnetite Arc.
Petersburg and St. Agatha..	Served by Baden	4	6	12	6	10	1 00	5.1	3.4	0.4	10		
Port Arthur..	22 25	4	2.5	6	2.5	10	1 00	2	1.3	0.15	10	5.00 8.30	60-w. Incan. 100-w. "
Port Credit...	28 00	4	4	8	4	10	1 00	3	2	0.25	10	11.00	" "
Port Dalhousie	21 50	4	3	6	3	10	1 00	2.1	1.4	0.2	10		
Port Robinson	Served by Welland	4	3	6	3	10	1 00	1.8	1.2	0.15	10		
Port Stanley..	42 70	4	4.5	9	4.5	10	1 00	5	3	0.4	10	16.00	" "
Prescott......	34 05	4	4	8	4	10	1 00	2.8	1.8	0.2	10		

Municipal Rates—Continued

1914

Municipality	Cost of Power to Municipality per H.P. per year	Lighting Rates					Power Rates					Street Lighting	
		Domestic		Commercial		Prompt Payment Discount	Per H.P. per Month	1st 50 Hr. per Month per Kw-hr.	2nd 50 Hr. per Month per Kw-hr.	All Add'l per Kw-hr.	Prompt Payment Discount		
		Per 100 Sq. Ft.	Per Kw-hr.	1st 30 Hr. per Kw-hr.	All Add'l per Kw-hr.								
	$ c.	c.	c.	c.	c.	%	$ c.	c.	c.	c.	%	$ c.	
Preston.......	21 00	4	4	8	4	20	1 00	2.3	1.6	0.2	20	11.00 12.00	60-w. Incan. 100-w. "
Rockwood	38 00	4	5.5	11	5.5	10	1 00	4.7	3.1	0.4	10	13.00	" "
Seaforth	40 00	4	4	8	4	10	1 00	4.3	2.9	0.4	10	15.00 12.00	" " 75-w. "
Sebringville ..	Served by Stratford	4	5	10	5	10	1 00	5.4	5.6	0.4	10		
St. Catharines	14 00	4	3	6c. 1st 30 hr. 3c. next 70 hr.	0.6	25	1 00	1.8	1.2	0.15	25	8.00	100-w. "
St. Mary's....	29 50	4	5	10	5	10	1 00	3.6	2.4	0.3	10	13.00 25.00 65.00	100-w. " 250-w. Nitrogen Arc
St. Thomas...	28 00	4	2.5	6	2.5	20	1 00	2.5	1.7	0.2	10	10.00 53.00	75-w. Incan. Arc
Stayner	43 57	4	4.5	9	4.5	10	1 00	4.2	2.8	0.3	10	12.00 9.00	100-w. Incan. 60-w. "
Stratford	30 00	4	4	8	4	20	1 00	3.6	2.4	0.3	10		
Sunderland...	Note A	3	6	12	6	10	1 00	4.5	3.0	0.4	10		
Thamesford ..	45 00	4	6	12	6	10	1 00	5.6	3.8	0.5	10	14.00	100-w. "
Thorndale....	45 00	4	6	12	6	10	1 00	5.6	3.8	0.5	10	14.00	" "
Tillsonburg...	32 00	4	4	8	4	10	1 00	3.8	2.5	0.3	10	11.00	" "
Toronto	15 00	4	3	8	3	10 to 20	1.35 1st 10h.p. 1.00 all add'l	1.5	1	0.5	10 to 20	9.00	" "
Walkerville...	38 00	3	4	8c. 1st 30 hr. 4c. next 70 hr.	0.8	10	1 00	3.6	2.4	0.3	10	10.50	60-w. "
Waterdown...	26 00	4	5	10	5	10	1 00	3.5	2.4	0.3	10	10.00	100-w. "

Waterloo.....	22 50	4	4	8	4	25	1 00	2.5	1.7	0.2	25	8.75 10.00 10.50 25.00 40.00	100-w. mul. or 75 w. series Incan. 100-w. ser. Incan. 150-w. mult. " 3-lt. Standard 1-100-w. & 2-60-w. 5-lt. Standard 1-100-w. & 4-60-w, Incan.
Welland......	14 00	4	3	6	3	25	1 00	1.8	1.2	0.15	25	18.00 9.00	250-w. Incan. 100-w. "
West Hamilton	Served by Dundas	4	4	8	4	10	1 00	2.8	1.8	0.2	10	14.00	" "
Weston.......	30 00	4	3	6	3	10	1 00	3	2	0.2	10	12.00 40.00	" " 5-lt. St., 4-100-w. Incan.
Winchester ..	43 77	4	4	8	4	10	1 00	3.1	2.0	0.25	10	15.00	100-w. Incan.
Windsor......	38 00	3	4	8c. 1st 30 hr. 4c. next 70 hr.	0.8	10	1 00	3.6	2.4	0.3	10		
Woodbridge...	33 83	4	4.5	9	4.5	10	1 00	3.9	2.6	0.3	10		
Woodstock ...	23 00	4	3	6	3	20	1 00	2	1.5	0.2	10	25.00 10.00	250-w. " 60 or 100-w. "
Woodville	Note A	3	6	12	6	10	1 00	4.5	3.0	0.3	10		

Note A—Service commenced during October, 1914.

Standard Interpretations of Rates as Used by Municipalities for Electric Service

GENERAL

(1) No electric service shall be given until a proper contract has been drawn up and signed by the prospective consumer, and by the corporation.

(2) A copy of these Interpretations shall accompany and be a part of every contract between consumers and corporations served by the Hydro-Electric Power Commission of Ontario.

(3) Contracts are for one year and are self-renewing from year to year, expiring only when notice is given by either party, one month prior to the expiration of a yearly term, or for non-payment of bills. All contracts terminate, as far as rates are concerned, upon the order of the Hydro-Electric Power Commission of Ontario.

DOMESTIC LIGHTING

(1) The rates for domestic lighting shall consist of a service charge of 4 cents per 100 square feet of floor area, and a consumption charge, being a rate in cents per kilowatt-hour.

The floor area of a house is obtained by taking its outside dimensions, omitting bay windows and similar projections. The area derived from such dimensions, multiplied by the number of floors and reduced by ten per cent (10%) gives the net area under the charge. Under this charge are included all parts of the house used for living and sleeping purposes, making verandahs, basements, unfinished attics and outbuildings exempt, except where any portion of these is so used, in which case only that portion shall be charged.

(2) The practice of omitting the service charge and giving an optional consumption charge for domestic power service is not permitted; likewise the use of flat rate contracts for house lighting service.

(3) The minimum service charge shall be 25 cents per month net.

(4) Power for domestic service shall not be sold at the power rates.

(5) Whenever free lighting service is granted to any municipal employee or official, the electric department shall bill the municipal department granting such service for the service given at the rates in use in the municipality.

(6) Where small motors, heating or cooking appliances or other electrical devices are used for domestic purposes, there shall be no additional service charge. The power so used shall be billed at the consumption charge only of the domestic lighting rate.

(7) Free porch lights will not be permitted except in municipalities where the Commission's consent is annually obtained.

(8) The practice of giving lamp renewals free of charge is not permitted, except in municipalities where the Commission's permission is annually obtained. Lamps shall be furnished by the corporation to consumers only, at cost, wherever the corporation elects to supply lamps or other electrical devices.

(9) Whenever small stores with dwellings are supplied through the same service, the consumer may be billed on either the domestic or the commercial lighting rate according to the mutual agreement of the consumer and the corporation.

COMMERCIAL LIGHTING

(1) The installed capacity of a commercial load is the total of the rated capacities of the lamps in use. In estimating the installed capacity of a commercial

consumer, the capacity of single-phase motors and heating appliances shall not be included in the total installed capacity used in billing, except where it is necessary to increase the capacity of the service to serve such appliances. Wherever this latter condition obtains, the installed capacity shall be taken as the normal capacity of the service so installed.

(2) If at any time the consumer changes the installed capacity, he shall notify the corporation of his intention so that contracts and bases of billing may be amended on the day on which such changes are made.

(3) The representative of the corporation shall have the privilege of visiting the consumer's premises during all reasonable hours to check up the installed capacity, and if, on making such an inspection, any increase is found, the contract shall be amended, and the consumer shall be billed for that month and for succeeding months in accordance with the amended contract.

(4) Commercial consumers having not more than 100 watts connected may be given a flat rate of 50 cents per month net.

(5) The minimum net bill for commercial service shall be 50 cents per month.

(6) There shall be no optional rate for all consumption to commercial users, nor will an optional flate rate for this class of service be permitted beyond that given in paragraph 4 above.

(7) No user shall be given a power contract to cover commercial lighting service.

(8) Churches shall be billed at half the commercial lighting rate, which rate shall include all charges for power whether used for lighting purposes or otherwise.

(9) Paragraph 8 under domestic lighting shall also apply to commercial users.

POWER

(1) Users of power shall be given contracts which shall be placed in various classes dependent on the time during which power is to be used. Corresponding to each class of contract is a discount to which monthly bills for power used under it shall be subjected. The contract classes and their corresponding class discounts are as follows:

Class A—24 hour unrestricted use	No discount.
Class B—24 hour restricted use	10% discount
Class C—10 hour unrestricted use	10 % discount.
Class D—10 hour restricted use	33⅓% discount.

A consumer taking power under Class "A" may use power 24 hours each day every day in the year.

In taking power under Class "B," the power may be used as under Class "A," except that no power shall be taken during the restricted hours listed in paragraph 2.

A Class "C" user may use power 10 hours a day every day in the year, *i.e.*, between 7 a.m. and 6 p.m.

When power is taken under Class "D" it may be used as in Class "C," except that no power shall be taken during the restricted hours listed in paragraph 2.

(2) Restricted Hours: Subject to revision according to load conditions.

Oct. 15th—Oct. 31st	5.30 p.m. to 6.30 p.m.
Nov. 1st—Nov. 30th	5.00 p.m. to 6.30 p.m.
Dec. 1st—Jan. 15th	4.30 p.m. to 6.30 p.m.
Jan. 16th—Feb. 15th	5.00 p.m. to 6.30 p.m.
Feb. 16th—Mar. 1st	5.30 p.m. to 6.30 p.m.

(3) Should a consumer take power in a higher class than that under which he is rated, he shall from that time be considered as automatically transferred to the higher class for the balance of the term of contract. If he is taking power under a Class "D" contract, and does not shut down during the restricted hours, he shall be billed as a Class "C" or Class "A" user for the remainder of the term of his contract. Or should he work overtime observing the restricted hours he shall then become a Class "B" user.

A Class "C" user may upon giving notice to the corporation to that effect, take power as under a Class "A" contract during months in which he may desire to work overtime. Upon discontinuing such 24 hour operation he shall again return to his original class. A Class "C" user cannot change to Class "B" temporarily.

(4) Contracts may be made for "Summer Power" which shall be for a period of not less than eight months and shall be for Class "A" or Class "C" power only.

(5) All motors supplied over the same service shall be included under the same contract, whether in the same or separate buildings.

(6) Power required for factory lighting may be included on the power contract where such exists provided such service can be given over the same service connections, and measured on the same meters as are required to take care of the power load. In fixing the service charge the capacity of the lighting transformers installed by the consumer shall be added to the total of the capacities of the motors and other equipment, except when the maximum demand is measured. Wherever factory lighting service is given over service connections and through meters not measuring energy for power purposes, commercial lighting rates shall be used.

(7) Whenever a consumer installs power equipment in addition to that already covered by his contract, he shall notify the corporation of such addition and his contract shall be amended to cover the whole equipment installed.

(8) The representative of the corporation shall have the privilege of visiting the consumer's premises during all reasonable hours to check up the power installation, and if on making such an inspection any increase is found, his contract shall be amended and the consumer shall be billed for that month and for succeeding months in accordance with the amended contract.

(9) If power is to be sold on maximum demand, the consumer must furnish a satisfactory maximum demand meter, or the municipality may furnish it, billing the consumer monthly for the use of this meter at the rate of 15 per cent per annum of the cost of the meter, plus the cost of the installation and chart paper.

(10) The local superintendent shall have these meters checked at proper intervals, and collect the charts each month when reading the watt hour meter, so that the determination of the maximum demand will be in the hands of the superintendent or other properly delegated authority. Should the maximum demand meter used be a dial type designed to indicate the maximum demand, its reading shall be taken each month at the same time as the watt hour meter is read.

(11) Wherever the load conditions are such that a definite established maximum demand may be determined it will not be necessary to instal a maximum demand meter.

(12) A consumer shall be billed on the maximum demand previously established until this demand shall have have become increased, after which the increased demand shall be used as the basis of billing.

(13) Where the installed capacity is 100 h.p. or less, the sustained peak of one minute duration shall be used as a basis of billing. For installations having over 100 h.p. connected, one additional minute shall be allowed for every additional 100 h.p. or part thereof up to and including 500 h.p. When the installed capacity exceeds 500 h.p. a 5 minute sustained peak shall be used.

(14) When no maximum demand meter is installed the service charge shall be based on the total horse-power connected, except as is provided in paragraph 11.

(15) A flat rate for power service is not permitted except in cases where the permission of the Commission is annually obtained.

(16) Where power is taken at 2,200 volts and extra discount of 5 per cent is to be given; where power is taken at 13,000 volts this extra discount shall be 10 per cent.

(17) Whenever a consumer installs a synchronous motor or other condenser equipment, and the municipality is given the use of such equipment for power factor correction purposes, an extra discount may be given from the monthly bills, subject to the approval of the Commission being annually obtained.

(18) Whenever the total installation of one consumer is 5 h.p. or less, single-phase current shall be supplied except where service can be given without the installation of secondary street mains. That is, should there be a three-phase feeder at motor voltage passing the premises, three-phase power may be given, but wherever it is necessary to install a feeder or transformers to serve one consumer, single phase power shall be supplied.

(19) The rate for welders, air compressor motors, elevators and similar loads shall be a service charge based on the rated capacity plus the standard consumption charges. Where graphic recording maximum demand meters are used to indicate the maximum demand of users having intermittent load of this class, the service charge shall be based on the maximum demand without the fluctuations created by these intermittent loads plus, the demand of the welders, compressor, or similar load as shown by the chart.

PROMPT PAYMENT DISCOUNTS

A municipality granting a discount for prompt payment of the accounts rendered the consumers will strictly enforce the condition upon which it is to be granted. It is never to be granted when payment is made after the last discount day.

When the consumer is 60 days in arrears the service shall be discontinued without notice, and service shall not be given again until payment is made in full, including a charge of $1 for the cost of reconnecting.

MUNICIPAL PURCHASES

The municipal electrical enterprises in Ontario require in the aggregate, large quantities of poles, line wire, cross arms, insulators, transformers, house service meters and of everything needed for the construction and maintenance of their various electrical projects.

This demand can in a measure be filled by individual municipal purchase, but this is not always satisfactory. Owing to the wide range in the variety of materials and in the requirements, the municipal officials may lack the training necessary to properly safeguard their interests, and may not know exactly what should be used and where it can be obtained to the best advantage. The requirements of an individual town are comparatively limited. It cannot always afford large quantities and accordingly has to pay higher prices. At times rush orders may be placed for urgently needed material, which through lack of provision, may not be in stock. For these and other reasons individual effort of this kind often means through lack of co-operation the more or less indiscriminate purchase of smaller quantities at higher prices, and the absence of an effective means of control which would tend to standardize quality and efficiency.

If the large requirements of the municipalities as a whole were combined and centralized, there would be created a purchasing agency which could control the various commercial conditions so that each municipality could obtain its comparatively smaller requirements under the favorable conditions attending competitive wholesale purchase.

To give practical effect to this centralized purchasing idea, the Commission maintains a Purchasing Department whose services are offered to any municipality or provincial institution in Ontario.

A list is given below of the municipalities who have already availed themselves of the facilities offered by this Department together with a summary of the more important items purchased. This list is necessarily condensed and by no means indicates the wide range of this Department.

The co-operation of these municipalities acting together in this way through the Commission has already shown important results. Their total requirements have enabled the Commission to obtain for them the various materials and apparatus desired at prices materially lower than those they had previously been paying individually. A few of the main items with the savings effected is as follows:

	Saving Over Previous Individual Prices
Service Transformers	25 to 50%
House Service Watthour Meters	10 to 25%
Tungsten Lamps and Carbon Lamps	25 to 50%
Rubber Covered Wire	10 to 25%

These are only a few of the economies effected, but they will serve to show what can be done by co-operation. With the support of a larger number of municipalities the Commission should be able to do even better, and we desire to call this feature to the attention especially of the newer municipalities who may not perhaps be aware of the advantages of purchasing in this manner.

In Toronto, the Commission has a large storehouse in which is stocked large quantities of line construction material, lamps and other items in general demand. Bulletin No. 1,007 describes the conditions under which lamps are supplied to

municipalities and full information on line hardware material is given in Bulletin No. 1,005. Any other items not carried in our stores can generally be obtained at wholesale prices, and attention is called to Bulletin No. 1,003 which describes a line of watt-hour meters of the highest grade at very attractive prices. Service transformers can also be obtained at low prices, and full information will gladly be given upon request.

The complete facilities of the Commission's Laboratory enable it at all times to test and check all of the various materials, devices and apparatus, and to see that these are continually supplied in accordance with the high standard set by the Commission.

During the past year the Commission has been successful in extending the use of household utilities such as irons, toasters, electric ranges, vacuum cleaners, washing machines, etc. It maintains an Advertising Department which is prepared to supply for the towns suitable literature, and in every way to give assistance calculated to promote the sale of these devices. It has made arrangements whereby all the standard devices of this kind may be obtained at very attractive prices. We wish to call particular attention to this feature of the Commission's service, especially as the use of these utilities not only becomes a valuable source of revenue to the town, but on the new Hydro rates their cost of operation is low enough to place them in the class of necessities and greatly extend their further use if properly pushed by the towns.

A summary of the more important purchases made for the municipalities during 1914 is approximately as follows:

Municipal Purchases

Town	Poles No.	Poles Value	Overhead Street Lighting	Transformers Kw.	Transformers Value	Lamps No.	Lamps Value	Meters No.	Meters Value	Switch Gear	General Supplies	Motors	Miscel-laneous	Total
		$ c.	$ c.		$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Acton			55 96			570	251 36	13	97 50					404 82
Ayr	59	135 25	2,333 42	70½	645 15	250	64 00	109	860 56					4,038 38
Baden	29	92 50	488 01	95	1,031 10	350	89 00	114	898 36					2,598 97
Barrie			270 00	25	200 28	1,660	598 17	50	375 00		77 81			1,521 26
Beaverton	96	428 50	1,254 69	5	58 50	24	12 60	112	846 30					2,600 59
Beachville			14 80			72	39 60				4 83			59 23
Beeton						100	25 00							25 00
Berlin	200	1,250 00	170 60	205	1,452 36	12,125	4,047 00	75	562 50	45 98	260 98			7,789 42
Blandford Twp.			80 00											80 00
Bobcaygeon			14 50			144	110 52							125 02
Bolton			991 25	58	858 25			70	525 00					2,374 50
Brampton			762 65	15	164 75	2,961	859 91	36	310 64		32 05			2,130 00
Brantford	75	330 00	499 78	81½	976 10	3.378	1,022 31	37	398 64		45 73			3,272 56
Breslau			169 55	132½	1,135 51	7	42 00	3	87 38					1,434 44
Brockville											15 00			15 00
Caledonia			45 90			48	25 20							71 10
Campbellford								6	48 42					48 42
Cannington			1,072 04	43	494 95	562	141 68	113	999 50					2,708 17
Chatham	1,225	7,264 00	105 00											7,369 00
Chesterville			703 77	5	52 40	1,524	424 00	63	624 50		401 95			2,206 62
Clinton			899 64	162	1,982 00	298	148 80	265	3,390 00		510 00	170 35	1,978 25	9,079 04
Coldwater			109 40			200	54 00	34	120 14					283 54
Collingwood			386 62			906	773 40				167 13			1,327 15
Creemore	28	135 80	2,967 88	80	679 37	172	88 80	1	54 00		54 96			3,980 81
Dixie			3,302 95	52	595 00									3,897 95
Dorchester	112	431 50	2,437 43	30½	323 00			2	60 00					3,251 93
Dresden	175	407 75		101½	1,384 00									1,791 75
Drumbo	90	132 10	1,535 25	30	343 40			52	428 56					2,439 31
Dundas	266	856 20	4,407 52	142	1,633 80	1,490	1,335 40	125	666 04	922 00	432 65			10,253 61
Elmira			130 71	7½	90 00	1,968	927 60	79	816 77		19 80			1,984 88
Elmvale			463 09	68	526 42	448	138 20	2	72 00		43 32			1,243 03
Elora	198	792 40	3,711 40	86	804 40	100	52 00	93	761 20		37 80			6,159 70
Embro	126	410 25	2,095 10	35	319 60			100	853 00					3,677 95
Fergus	240	477 75	4,451 62	132	1,208 25			149	1,195 92					7,333 54

Galt				60	433 50	6,200	1,799 10	1	156 88		252 20			2,641 68
Georgetown	263	1,756 50	2,946 42	289	1,994 00	628	206 12	53	521 85		120 35			7,545 24
Goderich			1,365 88	98½	1,099 73	1,314	513 10	30	588 10		251 04	282 00		4,099 85
Grantham Twp	450	2,249 10	71 00											2,320 10
Guelph			4,213 80	265	1,745 85	5,328	1,880 70	175	1,312 50		21 68			9,174 53
Hagersville			1,426 60	60	798 50	562	231 90	116	993 16		502 75			3,952 91
Hamilton	100	976 50	225 00	1,770	12,656 00	16,575	11,971 57	1,675	12,766 75					38,595 82
Hespeler			225 00	15	165 00	945	456 75	1	51 00					897 75
Ingersoll			250 00	39½	385 55	1,650	343 80	207	1,635 00		59 50	126 50		2,552 85
Kincardine						1,036	344 30	16	120 00					464 30
Kingston			411 70	105	829 00	354	2,180 00							3,420 70
Listowel			102 49			14	53 20	12	96 43		17 39			269 51
London	100	190 00	11,183 15	286	1,979 60	22,866	10,348 80	406	4,982 72		1,374 22			30,058 49
Lucan	116	250 50	1,917 25	40	442 00			55	425 35					3,035 10
Markham			50 00			798	218 90	6	45 00					313 90
Marmora			203 35			112	32 40							235 75
Merritton			75 00	55	429 25									504 25
Midland			319 00			1,801	1,185 14				1,060 44			2,564 58
Milton	78	120 00	2,180 00	75	497 20	994	426 20	15	178 93		143 00		20 88	3,566 21
Mimico	129	328 90	2,471 00	96½	719 35	121	63 50	112	951 66		112 57			4,646 98
Mitchell			146 17			923	233 48				31 42			411 07
Morrisburg			71 00	10	94 00	498	249 00							414 00
New Hamburg			40 41			1,344	410 80	2	200 60		112 67	94 00		858 48
New Toronto			1,781 08	43	462 95			40	316 00		2 00			2,562 03
North Bay						12	3 95							3 95
Norwich	468	2,150 00	735 05	44	974 30	1,365	362 50					910 22	193 50	5,325 57
Oakville											179 00			179 00
Orillia						312	170 40							170 40
Ottawa						5,680	1,984 74				529 33			2,514 07
Owen Sound			13 25	35	319 40	603	196 23	40	300 00					828 88
Oxford	8	40 00	126 09	2	32 30				7 50		54 18	189 00		449 07
Paris			18 35	48	57 60	58	585 58	2	60 86		371 00	442 00		1,535 39
Penetang			355 08	20	191 00	750	498 00	57	746 90		469 36			2,260 34
Peterboro'	60	182 50	1,412 25					701	2,873 10					4,467 85
Plattsville	85	192 00	1,721 20	77½	425 88	48	25 20	1	38 00					2,405 78
Prescott			1,255 61			364	172 00				22 62			1,450 23
Preston			1,349 94			2,374	823 14	25	190 07		15 56			2,378 71
Princeton	136	346 25	818 10	10½	157 00									1,321 35
Port Arthur			1,620 64			3,895	1,263 00	1,617	12,871 72		392 50			16,097 86
Port Credit	40	198 25	584 22	50½	451 75	148	78 90	37	441 00					1,754 12
Port Dalhousie	245	975 80	4,336 31	51	1,937 60	48	25 80	55	417 85					7,693 36
Port Stanley			94 50	10	85 00	1,042	324 30	1	28 50					532 30
Renfrew			33 45	5	20 00						60 00			113 45
Rockwood			90 25			300	77 00	16	135 40		86 32			388 97
Seaforth			598 50	10	140 00	1,922	842 14	48	488 04		254 68			2,323 36

Municipal Purchases—Continued

Town	Poles		Overhead Street Lighting	Transformers		Lamps		Meters		Switch Gear	General Supplies	Motors	Miscel-laneous	Total
	No.	Value.		Kw.	Value	No.	Value	No.	Value					
		$ c.	$ c.		$ c.		$ c.		$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Simcoe	696	2,300 30	1,829 00					100	750 00					4,879 30
Stayner			33 75			1,045	370 00	1	75 00					478 75
St. Catharines	555	1,874 35	8,502 60	707½	6,887 40	1,884	756 20				237 80			18,258 35
St. Mary's			624 09			1,866	754 21	26	347 40	280 00	360 90			2,366 60
Stouffville			200 05			724	218 70	24	174 00		7 50			600 25
Stratford	3	48 00	9,472 03	105	569 50	3,688	444 25	175	812 50	330 00	37 95			11,714 23
Strathroy	709	2,480 00	3,438 57	232½	2,087 95			409	1,914 12		4 84			9,925 48
Streetsville			50 66											50 66
St. Thomas	80	319 50	648 35	65	587 74	2,832	797 70	75	562 50		198 43			3,114 22
Sunderland			450 91			24	12 60	93	542 54					1,006 05
Tay Twp.			2,219 84					50	250 00					2,469 84
Thamesford			594 25	3	40 80	124	40 25	22	186 80		12 00			874 10
Thorndale			347 00	4	64 60	398	140 40	13	130 84		18 49			701 33
Tilbury			373 30											373 30
Tillsonburg			716 54	69	856 00	2,042	818 66	38	319 44		26 60			2,737 24
Toronto						76,198	24,800 61							24,800 61
Toronto Twp.	541	1,603 10	6,702 54	119½	1,160 80	450	117 15	147	1,294 83		6 82			10,885 14
Victoria Harbour			2,827 00					12	61 00					89 27
Wallaceburg	390	757 30	1,290 00	170½	1,307 00			200	1,500 00					4,854 30
Waterdown	352	1,431 45	3,247 69	106	1,374 95	398	120 70	10	186 50		74 00			6,435 29
Waterford			208 62					150	1,125 00					1,333 62
Waterloo	70	110 00	1,409 10	17	256 50	4,477	1,597 88	61	525 40		121 10			4,019 98
Waubaushene	80	200 00	1,726 81	25	119 54			50	232 00					2,278 35
Welland	100	264 70	5,041 27			3,556	867 84	8	80 57	75 00	84 50			6,413 88
Weston	101	347 50	3,119 32	54	514 90	1,456	609 50	1	33 00		211 57			4,385 79
Winchester	44	136 50	926 26			1,100	320 30	50	375 00					1,758 06
Windsor	1,575	8,247 00	92,142 09	560	3,286 50	10,398	7,117 99	1,950	17,304 75		410 00			128,508 33
Woodbridge	114	350 25	1,640 39	52	839 50	72	37 80							2,867 94
Woodstock	74	181 80	393 36	472	2,787 70	4,798	1,958 68	5	101 07		74 34			5,496 95
Woodville			788 44			298	129 10	71	415 00					1,332 54
Walkerville	335	2,057 50	11,810 42	1,174	13,027 25	500	125 00	110	862 20		79 15			27,961 52
York Twp.	424	1,197 75	3,312 97	59	681 15			59	530 67					5,722 54
Yarmouth				4	90 00			1	52 00					142 00
	11,440	47,007 75	245,810 59	9,698	83,024 77	230,669	94,008 21	10,977	89,686 71	1,652.98	10,565 78	2,214 07	2,192 63	576,163 49

MUNICIPAL ELECTRICAL INSPECTION

During the last fiscal year the work of the Electrical Inspection Department had been chiefly the completion of the Rules and Regulations and a certain amount of educational work in bringing the requirements of the Act before municipalities and distributing copies of the Rules and Regulations. At that time only one municipality had appointed an inspector, namely, the City of Ottawa. The present year has witnessed very significant progress made in the work of the Department and at the present not less than seventy municipalities have duly authorized electrical inspectors, viz.:

Municipality	Inspector
Ancaster	V. K. Stalford
Aurora	R. R. Matson
Aylmer	J. Millard
Barrie	K. S. Macdonnell
Bartonville	V. K. Stalford
Beamsville	V. K. Stalford
Beaverton	W. A. Morrison
Belleville	H. A. Thompson
Berlin	H. C. Fischer
Bobcaygeon	Sidney Cluxton
Brampton	Geo. Ostrander
Brantford	W. H. Mowat
Burford	W. H. Mowat
Burlington	V. K. Stalford
Caledonia	Bailey Jones
Cannington	W. A. Morrison
Chatham	W. H. Somers
Clinton	H. B. Chant.
Cobourg	Arthur Ovens
Collingwood	E. J. Stapleton
Dundas	V. K. Stalford
Essex	E. C. Weldrick
Fergus	Joseph Wilson
Ford City	E. C. Weldrick
Fort William	A. D. Smith
Georgetown	Geo. Ostrander
Goderich	W. H. Bullard
Grimsby	V. K. Stalford
Guelph	James Gass
Hagersville	James Laidlaw
Hamilton	V. K. Stalford, Chief Geo. Crawford, Asst. Geo. H. Fitzgerald, Asst.
Kingston	T. A. Hanley
London	W. B. Legate, Chief W. E. Ryder, Assistant
Markham	W. A. Morrison
Merritton	A. T. Smith
New Hamburg	Geo. Morley
Newmarket	R. R. Matson
Niagara Falls	C. E. Dilse
Norwich	K. W. Daykin
Oshawa	W. G. Mitchell
Ottawa	Norman E. Bell, Chief A. Croydan, Assistant
Owen Sound	J. R. McLinden
Paris	W. H. Mowat
Parry Sound	G. Groves
Petrolia	W. H. Somers
Port Arthur	Stirling Jaffray
Sandwich	E. C. Weldrick
Sarnia	Alf. Wheeler
Seaforth	Ed. Mole
Sebringville	Geo. F. Heideman
Stoney Creek	V. K. Stalford
Stouffville	W. A. Morrison
Stratford	Geo. F. Heideman
St. Thomas	Geo. Howse
Strathroy	E. R. Smitherim
Sunderland	W. A. Morrison
Thurlow Tp.	H. A. Thompson
Tillsonburg	J. E. Teckoe
Toronto	Jas. Shields, Chief (Staff of Assistants to be appointed)
Trenton	H. A. Thompson
Uxbridge	W. A. Morrison
Walkerville	E. C. Weldrick
Waterdown	V. K. Stalford
Welland	C. E. Dilse
West Hamilton	V. K. Stalford
Whitby	A. C. Cameron
Windsor	E. C. Weldrick
Winona	V. K. Stalford
Woodstock	H. Webster
Woodville	W. A. Morrison

The following municipalities are at present dealing with the Department, and in all of these appointments will be made and inspection enforced probably before the end of the year, viz.: Peterboro, Lakefield, Lindsay, Campbellford, Port Hope, Omemee, Millbrook, St. Catharines, Port Dalhousie, Thorold, Bridgeburg, Fort Erie, Font Hill, Richdill, Fenwick, Port Robinson, Port Colborne, Crowland Township, Acton, Tavistock, St. Mary's, Galt, Preston, Hespeler, Waterloo, Elmira, Ayr, Cobalt, Haileybury, New Liskeard, Orillia, Midland, Penetang, Coldwater, Stayner, Wallaceburg, Dresden, Flesherton, Walkerton, Hanover, Palmerston, Sault Ste. Marie, Havelock, Merrickville, Comber, Simcoe, Chesterville, Winchester, Prescott, Morrisburg, and a number of small villages and townships adjacent to the above.

It will be noted that in some instances there are two, and even three inspectors necessary to take care of the volume of work requiring attention, and in the case of the City of Toronto there will be at least fifteen inspectors under the chief inspector.

It is also of importance to note that these Inspection Departments extend well across the Province, and with the exception of some important centres where appointments are pending, there will be few places where an inspector cannot be reached from an adjoining municipality. In all cases due care has been exercised in requiring the appointment of only competent inspectors and as a result a very good class of men has been secured.

During the past year the Department has carried on a steady correspondence with not only the inspectors from the various districts, but with electrical contractors, engineers, manufacturers and supply houses all over the Province, who, realizing the necessity of adapting themselves to the regulations, require a great many decisions and interpretations of the rules. All of this correspondence has received prompt attention.

The Inspection Departments throughout the Province have in most cases proved self-supporting, and some cases have even shown a surplus. The fees charged are considerably below the average of those throughout the United States and some parts of Canada.

The Department has made a large number of special inspections, in different towns where electricity is being introduced, by an inspector directly from the Department. In these cases only the actual cost to the Commission has been charged, and the inspector has been able to visit many municipalities and inspect the chief installations therein, reporting to the town authorities, and insuring action being taken to remedy defective work. So satisfactory has this branch of the work proved that it will be continued even to a greater extent during the coming year.

During the year, 1,363 inspections have been made direct from this Department, these being quite distinct from inspections carried on by municipal inspectors and made in small municipalities where no permanent inspector has been provided. They have been a great assistance to the municipalities, as only the actual cost of the work has been charged, and the inspector has in most cases covered the entire municipality in one day's time, so that the cost per inspection has been very low.

Some fatalities have occurred in the Province during the past year from electrical causes, each of which would have been prevented had the electrical work complied with the requirements of the Rules and Regulations.

The inspectors of the Commission have in many cases visited outside inspection departments and assisted in the organizing of such departments, and, altogether, a very large amount of work has been satisfactorily executed.

Many favorable comments on the Rules and Regulations have been received from all sources, and it is very gratifying to note that after these Regulations have been put to the test during the past year, there have been practically no criticisms whatever.

In ordinary house wiring a very significant improvement has been made in the introduction of sealed service boxes, which is an entirely new departure in this Province.

In conclusion, we are glad to report that the work of the Department has been extended very much and it is expected by the end of the next year that the Province will be well under inspection if we can secure the co-operation of the municipalities. This by making it practically impossible for any uninspected electrical installation to be carried out, will tend greatly to reduce the fire and accident hazard.

FAIRS AND EXHIBITIONS

Canadian National Exhibition

Arrangements were made with a number of manufacturers for the erection of a Model Barn and Dairy, equipped throughout with stable fittings and appliances, such as would be used for the ordinary sized farm for demonstration purposes at the Canadian National Exhibition, 1914. A 5-horse power motor was installed in the stable on the ceiling, belted to a line shaft on the ceiling one foot out from the piers, arranged to run at about 300 revolutions per minute. From this line shaft, belts were run up through the floor to the following machinery which was installed in the mow. An individual grain separator, having a capacity of 60 to 100 bushels per hour, silo-filling box of the individual carrier type and a silo-filling box of the individual blower type; in the stable was installed, a root pulper and a milking machine, one of the type having a pump as a part of the pail equipment, no pulsator, the pump working from zero to full vacuum value and back again eliminating the necessity for one.

The dairy was equipped completely with all of the devices necessary for the production of good butter and for keeping the plant in a sanitary condition. This equipment consisted of a cream separator, churn and butter-worker, belted to a line shaft which was suspended from the ceiling and which was driven by a one-half horse power motor supported on brackets near the ceiling. In addition to this, there was the Commission's electric water heater of 20 gallons capacity, a metal sink, bottle washers, print makers, aerator and Babcock butter tester.

Each of the manufacturers having apparatus on display had a demonstrator with it. All of the machines were kept operating during the time that the exhibit was open each day. Information was given out regarding the possibility of applications of power to farm machinery, as well as general information regarding how to procure a supply for the district in which the inquirer lived.

Both of the buildings were lighted throughout by a system installed completely in conduit, controlled by switches. Close to the silo was located a "Syndicate" electric outfit for silo-filling and threshing, consisting of a 20 horse-power motor installed in one wagon, the necessary transformers, meters and connections installed in another wagon, and one of the largest ensilage cutting boxes.

Fair Demonstrations

During the year demonstrations of electrical household appliances and small power farm machines operated by electric power were made at Prescott Fair, Winchester Fair, Beaverton Fair, Kingston Fair, Guelph Winter Fair, Ontario Corn Growers' Exhibition at Chatham, Dundas Hydro-Electrical Industrial Exposition, and Arkona.

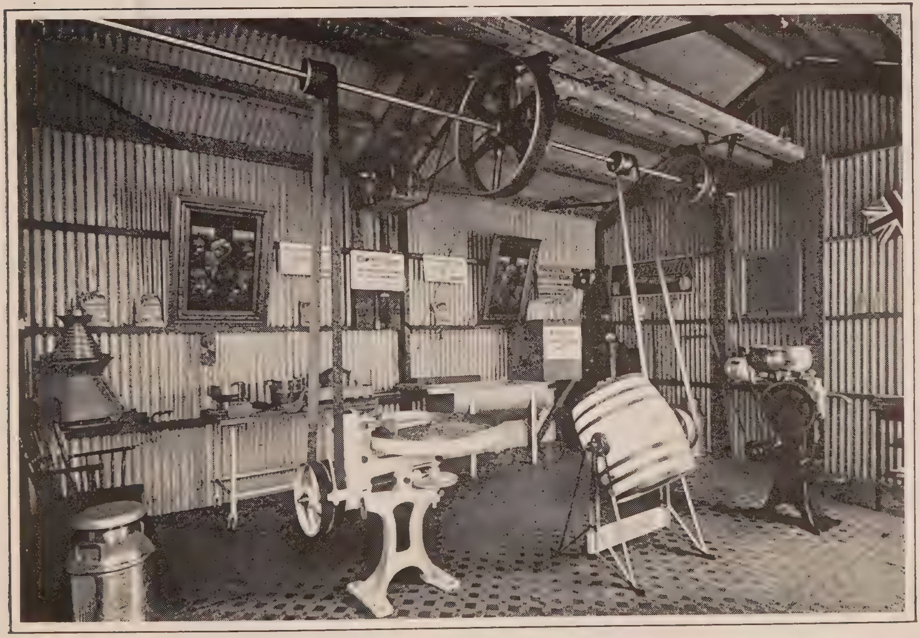
Practical demonstrations were made of milking, grinding grain, separating cream, heating water, besides the making of toast, tea, coffee and cooking a full meal.

An expert demonstrator was in charge of the utensils, in addition to the engineer who was in charge of the demonstration.

Municipal Demonstration

Among the number of Municipalities that made demonstrations at their local fairs of the different cooking utensils, the applications of electricity for power for the farm and for the manufacturer, besides the improved types of lamps, shades, fixtures, fitting, etc., for lighting, were Woodstock and Goderich.

Motor and Shafting in Model Barn—Canadian National Exhibition



Model Dairy Driven by "Hydro-Electric" Power—Canadian National Exhibition

RURAL DEMONSTRATIONS

Silo-Filling

Report of the uses that were made of Outfits No. 4 and 5, while demonstrating in Oxford and Middlesex counties during the year are given below.

These outfits, which consisted of a 20 h.p. motor mounted on one wagon and transformers, cable reel, meters, etc., on another wagon, were built with the understanding that some of the men at whose places they were being used would purchase them. Places at which they were used are referred to as Farms No. 1 to 6 under the outfit No. 4, and Farms No. 1 to 7 under outfit No. 5.

OUTFIT No. 4

At T. H. Dent's, Blandford Township, just outside of Woodstock: Sept. 25th-29th, 1914.

At Wm. Jull & Sons, Norwich Township, North Line: Oct. 2nd, 3rd, and 5th, 1914.

At E. E. Hanmer's: Oct. 6th and 7th and Nov. 11th, 1914.

At A. E. Cornwell's, North Norwich Township, East Line: Oct. 8th and 9th, 1914.

At Walter Lossing's, North Norwich Township, East Line: Oct. 10th, 12th and 13th, 1914.

At J. P. Stephens', North Norwich Township, East Line: Oct. 14th and 15th, 1914.

OUTFIT No. 5

At Charles Hunt's, Lot 13, Con. 3, Dorchester Township, Gore: Sept. 28th, 1914.

At James Mitchell's, Lot 11, Con. 2, Dorchester Township, Gore: Sept. 28th, 29th, and 30th, 1914.

At S. H. Wood's, Lot 10, Con. 1, Dorchester Township: Sept. 30th and Oct. 1st, 1914.

At Baskerville Brothers', Lot 5, Con. 4, East Nissouri Township: Oct. 2nd, 3rd, and 5th, 1914.

At Bolton Fitzgerald's, Lot 7, Con. 3, East Nissouri Township: Oct. 5th and 6th, 1914.

At R. Stinson's, Lot 7, Con. 4, East Nissouri Township: Oct. 6th, 7th, and 8th, 1914.

At J. McKay's, Lot 19, Con. 1, N. Oxford Township: Oct. 9th-13th, 1914.

At Wallace Brothers', Thamesford: October 29th-30th, 1914.

At George Hogg's, Thamesford: Nov. 9th, 1914.

Outfit No. 4

Farm No. 1

Silos	No. 1. 20 ft. by 20 ft. by 25 ft.
	No. 2. 14 ft. by 40 ft. (round).
Heights to elevate	27 ft. and 40 ft.
Capacity	No. 1. 10,000 cu. ft.—200 tons.
	No. 2. 6,056 cu. ft.—150 tons.
Amount put in	No. 1. Full.
	No. 2. 30 ft.—4,617 cu. ft.—100 tons.
Time	Set—4 days.
	Running—30 hours.
Kilowatt-hours	Used 504.
	Per ton put in—1.68.
Horse-power	A 20 h.p. motor used.
	Demand 12 h.p. to 27 h.p.
Tons per hour	11.66.
Cost	Total at 4 ct. per kw-hr., $20.16.
	Per ton put in—5.76 ct.
Distance to field	140 rods.
Labor	Most of the time—4 teams and drivers and 5 men.
Condition of corn	Fairly green.
Length of cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	864 r.p.m. on No. 1 Silo and 1,000 r.p.m. on No. 2 Silo.

NOTE.—As this was the first place this outfit was used, it took some time to get the box and belt broken in.

Farm No. 2

Silos	No. 1. 12 ft. by 35 ft.
	No. 2. 12 ft. by 35 ft.
Height to elevate	37 ft.
Capacity	No. 1. 3,959 cu. ft.—100 tons.
	No. 2. 3,959 cu. ft.—100 tons.
Amount put in	Both full.
Time	Set—2.25 days.
	Running, 14.75 hours.
Kilowatt-hours	Used 364.
	Per ton put in—1.82.
Horse-power	A 20 h.p. motor used.
	Demand not noted.
Tons per hour	13.57.
Cost	Total at 4 ct. per kw-hr., $14.56.
	Per ton put in—7.28 ct.
Distance to field	40 rods.
Labor	5 teams and drivers and 6 men.
Condition of corn	Dry.
Length of cut	½ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	1,000 r.p.m.

Farm No. 3

Silo	14 ft. by 40 ft.
Height to elevate	40 ft.
Capacity	6,056 cu. ft.—150 tons.
Amount put in	Full and chute filled.
Time	Set—1.5 days. Running, 13.25 hours.
Kilowatt-hours	Used 310. Per ton put in—2.07.
Horse-power	A 20 h.p. motor used. Demand 12 h.p. to 27 h.p.
Tons per hour	11.3.
Cost	Total at 4 ct. per kw-hr., $12.40. Per ton put in—8.21 ct.
Distance to field	25 rods.
Labor	4 teamsters and drivers and 4 men.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	1,000 r.p.m.

Farm No. 4

Silo	14 ft. by 42.5 ft.
Height to elevate	42 ft.
Capacity	6,541 cu. ft.—163 tons.
Amount put in	Full and chute filled.
Time	Set—2 days. Running—15 hours.
Kilowatt-hours	Used 329. Per ton put in—2.02.
Horse-power	A 20 h.p. motor was used. Demand 12 h.p. to 27 h.p.
Tons per hour	10.85.
Cost	Total at 4 ct. per kw-hr., $13.16. Per ton put in—8.07 ct.
Distance to field	10 rods to No. 1 field. 25 rods to No. 2 field.
Labor	4 teams and drivers and 5 men.
Condition of corn	Quite green.
Length of cut	½ inch for first 33 ft., then ⅜ inch to finish and to fill the chute.
Details of box	"Bell No. 60" with automatic feed table.
Speed	1,000 r.p.m.

Farm No. 5

Silo	14 ft. by 42.5 ft.
Height to elevate	42 ft.
Capacity	6,541 cu. ft.—163 tons.
Amount put in	Full.
Time	Set—2.5 days.
	Running—11.2 hours.
Kilowatt-hours	Used 354.
	Per ton put in—2.16 ct.
Horse power	A 20 h.p. motor used.
	Demand 12 h.p. to 40 h.p.
Tons per hour	14.5.
Cost	Total at 4 ct. per kw-hr., $14.16.
	Per ton put in—8.7 ct.
Distance to Field	20 rods.
Labor	4 teams and drivers and 4 men.
Conditions of corn	Dry most of the time.
Length of cut	½ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	1,000 r.p.m.

NOTES: (a) ½-inch cut with wet corn was the reason for the demand going as high as 40 h.p. and it would take more. Short cut should not be used when corn is wet.

(b) An accident happened while running ½-inch cut on wet corn, a hole being punched through the bottom of the steel case. No stone, nail, nor piece of hard metal was found.

Farm No. 6

Silo	16 ft. by 40 ft.
Height to elevate	40 ft.
Capacity	8,044 cu. ft.—180 tons.
Amount put in	30 ft.—6,033 cu. ft.—120 tons.
Time	Set—2 days.
	Running—12 hours.
Kilowatt-hours	Used 131.
	Per ton put in—1.09.
Horse-power	A 20 h.p. motor was used.
	Demand not noted.
Tons per hour	10.
Cost	Total at 4 ct. per kw-hr., $5.24.
	Per ton put in—4.37 ct.
Distance to field	50 rods.
Labor	4 teams and drivers and 4 men.
Condition of corn	Dry.
Length of cut	½ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	865 r.p.m.

Outfit No. 5

Farm No. 1

Height to elevate	35 ft.
Capacity	14 ft. by 35 ft.—125 tons.
Amount put in	14 ft. by 8 ft.—1,232 cu. ft.—27.7 tons.
Time	Set—.5 days. Running—2 hours.
Kilowatt-hours	Used 20. Per ton put in—.725 ct.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	13.8.
Cost	Total at 4 ct. per kw-hr., $0.80. Per ton put in—2.9 ct.
Labor	Not noted.
Condition of corn	Dry.
Length of Cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

Farm No. 2

Silo	12.7 ft. by 41.5 ft.
Heights to elevate	40 ft.
Capacity	5,241 cu. ft.—129 tons.
Amount put in	Full.
Time	Set—1.5 days. Running—10.25 hours.
Kilowatt-hours	Used 158. Per ton put in—1.23.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	12.6.
Distance to field	20 rods.
Cost	Total at 4 ct. per kw-hr., $7.32. Per ton put in, 5.7 ct.
Labor	Not noted.
Condition of corn	Dry.
Length of cut	⅜ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

Farm No. 3

Silo	14 ft. by 30 ft.
Height to elevate	27 ft.
Capacity	4,620 cu. ft.—100 tons.
Amount put in	Full.
Time	Set—1 day. Running—7.5 hours.
Kilowatt-hours	Used 153. Per ton put in, 1.53.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	13.3.
Cost	Total at 4 ct. per kw-hr., $6.12. Per ton put in, 6.12 ct.
Distance to field	30 rods.
Labor	Not noted.
Condition of corn	A little green.
Length of cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

Farm No. 4

Silo	15 ft. by 30 ft.
Height to elevate	30 ft.
Capacity	5,391 cu. ft.—110 tons.
Amount put in	Full.
Time	Set—2 days. Running—10.7 hours.
Kilowatt-hours	Used, 168. Per ton put in, 1.53.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	10.3.
Cost	Total at 4 ct. per kw-hr., $6.72. Per ton put in, 6.11 ct.
Distance to field	50 rods.
Labor	4 teams and drivers and 3 men.
Condition of corn	Medium.
Length of cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

NOTE—A stone went through the box, wrecking knives, fans and ledger plate.

Farm No. 5

Silo	14 ft. by 30 ft.
Height to elevate	32 ft.
Capacity	4,617 cu. ft.—100 tons.
Amount put in	Full.
Time	Set—1.5 days. Running—10.33 hours.
Kilowatt-hours	Used, 167. Per ton put in, 1.67.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	9.66.
Cost	Total at 4 ct. per kw-hr., $6.68. Per ton put in, 6.68 ct.
Distance to field	30 rods.
Labor	4 teams and drivers and 3 men.
Condition of corn	Very heavy—quite green.
Length of cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

Farm No. 6

Silo	14 ft. by 30 ft.
Height to elevate	32 ft.
Capacity	4,617 cu ft.—100 tons.
Amount put in	Full.
Time	Set—1.5 days. Running—89 hours.
Kilowatt-hours	Used, 140. Per ton put in, 1.4.
Horse-power	A 20 h.p. motor was used. Demand not noted.
Tons per hour	11.2.
Cost	Total at 4 ct. per kw-hr., $6.40. Per ton put in, 6.4 ct.
Distance to field	30 rods.
Labor	4 teams and drivers and 3 men.
Condition of corn	Good, quite green.
Length of cut	¾ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 r.p.m.

Farm No. 7

Silo	12 ft. by 40 ft.
Height to elevate	30 ft.
Capacity	4,524 cu ft.—121 tons.
Amount put in	Full.
Time	Set—4 days (Sunday and holiday included). Running, 10.5 hours.
Kilowatt-hours	Used, 216. Per ton put in, 1.79.
Horse-power	A 20 h.p. motor was used. Demand 12 h.p. to 40 h.p. (later due to wet corn).
Tons per hour	11.52.
Cost	Total at 4 ct. per kw-hr., $8.64. Per ton put in, 7.15 ct.
Distance to field	100 rods. 5 teams and drivers and 4 men.
Condition of corn	Dry part of time, then very wet.
Length of cut.	¾ and ½ inch.
Details of box	"Bell No. 60" with automatic feed table.
Speed	900 and 1,000 r.p.m.

NOTE.—It was found that with ½-inch cut and wet corn the amount of power needed to cut and elevate corn was greater than 40 h.p.; in fact, it is probably impossible under some conditions.

RURAL APPLICATIONS OF ELECTRICITY

General

The amount of business that there is in the rural districts, by reason of the fact that the farms are large in a good many sections, makes it necessary for the Commission to proceed with caution.

The advantages of electric power over that which is at present in use —steam, gasoline, wind-mill and sweep power, are quite apparent to the farmer in most districts, but the question with him is how he can apply the power so as to receive full value for the money expended per year for service and power. Until quite recently, the farmer in most districts would not concede that his time is worth so much per hour, as well as the time of his men, the members of his family and his teams. In order to make a fair comparison between the cost by present methods and by electric drive, it is necessary to take into consideration the saving of time, whether it is work that is done by himself or his help, or whether it is borrowed help which he has to pay back, such as the system which is in vogue for giving assistance during periods when thrashing and silo-filling is being done.

The development of this class of business must necessarily be allied with the development of the system for serving other municipalities in the district. As service cannot be taken direct from the high-tension or low-tension lines which are run through the country, it must be taken from a step-down station at which a voltage that is suitable for use for rural distribution is available. This means that in some cases lines will have to be duplicated on the same set of poles—the rural line being run below the low-tension lines.

The uses of electricity in rural sections may be classified as follows:

Service to the farm for lighting, power and cooking, including power for thrashing and silo-filling.

Service to rural plants which use power, such as brick-yards, tile-yards, saw mills, cheese factories, butter factories, pumps for reclamation and irrigation, chopping mills, flour mills, beet sugar factories, sand and gravel plants, railway pumping stations, quarries, institutional schools and farms.

Service for lighting of hamlets.

Power

Industrial Plants in Rural Districts.

Brick and Tile Yards

In general farming districts there are a considerable number of brick and tile yards—nearly every township having from two to five.

The amount of power needed by each of these varies from 20 to 50 h.p., depending on the size of the plant. The operation varies greatly also. In the medium-sized yard, two 10-hour days per week of run is about the average.

The season which these yards are operated is about 7 months.

Occasionally a saw mill is operated in conjunction with a tile yard.

Farm Applications

LIGHTING

The farmers in the districts that are being served greatly appreciate the improved condition on their places by reason of having electric light in the house, barn, drive, shed and yard. With previous forms of lighting, the dull appearance of the place from the road and from the yard had a depressing effect. The contrast that is the result of installing electric light makes homes in these districts so exceedingly comfortable that it will probably be beneficial in keeping the young people on the farm. In addition to this, the decrease of fire risk on the premises due to the absence of coal oil lanterns and lamps is one of the features that is usually considered by the farmer in arriving at a conclusion regarding the installation of electric service on his premises.

Installations in barns are now being made in conduit, as it is found necessary for the protection of the wires and fittings.

The cost of installation varies in the different districts according to conditions; the open wiring from $1.25 to $1.75 per outlet and the concealed wiring from $1.50 to $2.25 per outlet.

Conduit installations in the open; that is, in barns and farm buildings, vary from $3.25 to $4.50 per outlet.

The outlet in each of the above cases is the opening for either fixture or switch and does not include (except in cases where drop cord is used) the fixture, but does include the switches.

DOMESTIC AND SYNDICATE USES

Below are submitted some tables showing the uses of electricity on the farm for domestic purposes, for power in the barn, as well as for the large and small motor outfits for threshing, silo-filling, etc.

Most of the data submitted is taken from notes that are made from time to time by the men at the work, and in some cases show a discrepancy such as in the threshing of the Waterloo Township Syndicate No. 1, which discrepancy is probably due to over or under reading the meter at some place.

The results secured upon six farms located in various parts of the Province and employing power for milking, grinding, separating cream, cutting dry corn, heating water, lighting, silo-filling, threshing and various domestic uses are also given below.

Threshing

Township	Farm Number	Time: Set Days	Time: Running Hours	Grain in Bushels: Wheat	Grain in Bushels: Oats or Mixed	Grain in Bushels: Barley	Grain in Bushels: Total	Bushel per Hour	Total Kw-hr.	Average Bushel per Kw-hr.	Bushel per Kw-hr.	Cost: At $4\frac{1}{2}$c. per Kw-hr.	Cost: Per 100 Bush. at $4\frac{1}{2}$c. per Kw-hr.	Cost: If done by Steam by Custom Rig.	Notes
												$ c.	c.		
E. Nissouri...	No. 1	2	$15\frac{1}{6}$	231	1,312	474	2,017	133.5	280	.1388	7.3	12 60	62.95	$16\frac{1}{2}$ hr. at $1.75 = $28.87	Sawyer Massey 36-in. separator with band cutter, automatic table, tailings elevator, chaff and straw blowers and straw cutter, the latter out of order and not used
N. Oxford	No. 2	1	$9\frac{1}{2}$	....	1,380	....	1,380	145.2	174	.126	7.93	7 83	56.7	$9\frac{1}{2}$ hr. at $1.75 = $16.62	
N. Norwich...	No. 2	1	$6\frac{5}{6}$	....	710	....	710	103.	130	.183	5.4	5 85	82.4	7 hr. at $1.00 = $7.00	
														By Syndicate rig.	For Engine only (syndicate outfit)
Waterloo ...	No. 1	.....	34	760	2,000	240	3,000	88.2	297	.099	10.4	13 37	44.57	34 hr. at $1.00 = $34.00	Engine only, if done by steam, at $1.00 per hour
	No. 2	.....	30	540	1,395	175 90 Peas	2,290	76.3	665	.29	3.4	29 93	131.1	30 hr. at $1.00 = $30.00	Record of work kept by men at it—there is a discrepancy in the items, but the total is correct. Threshing from field may account for some of it
	No. 3	.....	$14\frac{1}{2}$	275	1,500	....	1,775	122.3	268	.151	6.63	12 06	67.94	$14\frac{1}{2}$ hr. at $1.00 = $14.50	
	No. 4	.....	15	250	1,500	....	1,750	116.66	286	.163	6.12	12 87	73.5	15 hr. at $1.00 = $15.00	
	No. 5	.....	35	540	1,790	380	2,710	77.5	540	.199	5.02	24 30	89.	35 hr. at $1.00 = $35.00	The Separator was a 36-44 Waterloo with all attachments, including straw cutter
	No. 6	.....	21	550	1,620	200	2,370	112.8	452	.19	5.24	24 30	102.5	21 hr. at $1.00 = $21.00	

Waterloo Township Syndicate

SILO-FILLING

Farm No. 1

Silo	14 ft. by 39 ft. round.
Height to elevate	Not noted.
Capacity	6,002 cu. ft.—145 tons.
Amount put in	36 ft. 5,540 cu. ft.—133.83 tons.
Time	Set—not noted. Running—12 hours.
Kilowatt-hours	Used, 372. Per ton put in, 2.57.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	11.15.
Cost	Total at 4 ct. per kw-hr. $14.88. Per ton put in, 11.11 ct.
Distance to field	Not reported, approximately 20 rods.
Labor	Not reported.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not reported, approximately 900 r.p.m.

Farm No. 2

Silo	12 ft. by 42 ft. round.
Height to elevate	Not noted.
Capacity	4,750 cu. ft.—128 tons.
Amount put in	39 ft. 4,411 cu. ft. 119.1 tons.
Time	Set—not noted. Running—10 hours.
Kilowatt-hours	Used, 183. Per ton put in, 1.43.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	11.91.
Cost	Total at 4 ct. per kw-hr., $7.32. Per ton put in, 6.14 ct.
Distance to field	Not reported.
Labor	Not reported.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not reported, approximately 900 r.p.m.

Electric Motor Supplanting the Steam Engine at Threshing—E. Nissouri Township

Threshing by "Hydro-Electric" Power –Waterloo Township

Farm No. 3

Silo	11 ft. by 30 ft.
Height to elevate	Not noted.
Capacity	2,850 cu. ft.—58 tons.
Amount put in	Full.
Time	Set—not noted. Running—7 hours.
Kilowatt-hours	Used, 58. Per ton put in—1.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	8.3.
Cost	Total at 4 ct. per kw-hr., $2.32. Per ton put in, 4 ct.
Distance to field	Not noted.
Labor	Not noted.
Condition of corn	Not noted.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not reported, approximately 900 r.p.m.

Farm No. 4

Silos	22 ft. by 8 ft. by 9 ft. 22 ft. by 9 ft. by 10 ft.
Height to elevate	Not noted.
Capacity	3,564 cu. ft.—54 tons.
Amount put in	Full.
Time	Set—not noted. Running—7.5 hours.
Kilowatt-hours	Used 58. Per ton put in, 1.06.
Horse-power	A 20 h.p. motor used. Demand not noted.
Tons per hour	7.73.
Cost	Total at 4 ct. per kw-hr., $2.32. Per ton put in, 4.3 ct.
Distance to field	Not noted.
Labor	Not noted.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not reported, approximately 900 r.p.m.

Farm No. 5

Silo	12 ft. by 40 ft.
Height to elevate	Not noted.
Capacity	4,524 cu. ft.—121 tons.
Amount put in	Full.
Time	Set—not noted. Running—10 hours.
Kilowatt-hours	Used, 135. Per ton put in, 1.11.
Horse-power	A 20 h.p. motor was used. Demand not noted.
Tons per hour	12.1.
Cost	Total at 4 ct. per kw-hr., $5.40. Per ton put in, 4.46 ct.
Distance to field	Not noted.
Labor	Not noted.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not reported, approximately 900 r.p.m.

Farm No 6

Silo	14 ft. by 29 ft.
Height to elevate	Not noted.
Capacity	4,463 cu. ft.—95 tons.
Amount put in	Full.
Time	Set—not noted. Running—9 hours.
Kilowatt-hours	Used, 90. Per ton put in, 95.
Horse-power	A 20 h.p. motor was used. Demand not noted.
Tons per hour	10.55.
Cost	Total at 4 ct. per kw-hr., $3.60. Per ton put in, 3.8 ct.
Distance to field	Not noted.
Labor	Not noted.
Condition of corn	Medium.
Length of cut	½ inch.
Details of box	"Climax" with automatic feed table.
Speed	Not noted, approximately 900 r.p.m.

Waterloo Township Syndicate No. 1

6 FARMERS

Domestic Uses and Syndicate Motor Uses

Rate Service Charge $2.40 per Month Power Charge $4\frac{1}{2}$c. per Kw-hr. Discount from Power Charge only 10 Per Cent.	Domestic							Syndicate Motor		Total Dom. and Syn. Motor Kilowatt-Hours for Year	Cost per Year		
	Kilowatt-Hours							Kilowatt-Hours.					
	Sept.	Oct.	Nov.	Dec.	Total	Average per Day	Estimated for a Year	Aug. '1 to Oct. 23	Estimated for a Year		Current	Service Charge	Total
											$ c.	$ c.	$ c.
Farm No. 1	22	27	27	26	102	.84	306	669	836	1,142	46 25	30 00	76 25
Farm No. 2	27	32	49	49	157	1.29	471	848	1,060	1,531	62 00	30 00	92 00
Farm No. 3	22	31	36	37	126	1.04	368	685	856	1,224	49 58	30 00	79 58
Farm No. 4	15	26	28	29	98	.8	294	404	505	799	32 36	30 00	62 36
Farm No. 5	19	29	37	33	118	.97	354	348	435	789	31 95	30 00	61 95
Farm No. 6	15	13	30	41	99	.82	297	597	746	1,043	42 24	30 00	72 24
Totals	120	158	207	215	700	5.76	2,090	3,551	4,438	6,528	264 38	30 00	444 38
Farm No. 7	Inside Water	loo		....	....	....	....	....	400	400	....	....	....

NOTE—No utensils or motors other than the Syndicate Motor in use, but these are included in estimate of annual uses.

Farm No. 1

Operation	Times used per Year	Used each Time	Total Hours used per Year	H.P. of Motor	Consumption		Cost		Notes
					Demand in Kw.	Kw-hr. for the Year	Total	Unit	
							$ c.		
Milking	730	1.34 hr.	975	2	1.2	1,170	19.06	.065 ct.	36 to 50 Cows
Grinding	....	....	....	....	....	....	....	....	Started Jan. 1915
Washing Bottles	120	.34 hr.	40	2	.7	28	.45	.375 ct. per day	Once each day
Separating Cream	365	.5 hr.	182½	2	.7	127	2.04	.65 ct. per day	No note of quantity
Cutting Dry Corn	14	34 hr.	5	2	1.2	6	9	.31 ct. per feeding	28 feedings for 50 head of cattle
Electric Iron	....	....	260	....	.5	130	2.09	4.00 ct. per week	All of the ironing
Water Heating	300	8 hr.	2,400	....	.6	1,440	23.44	.39 ct. per 100 gals.	6,000 gal. of water heated
Toaster	365	34 hr.	122	....	.5	111	1.80	.49 ct. per day	
Lighting	....	....	....	....	....	3,438	55.83	1.65 ct. per kw-hr.	
Silo-Filling	....	....	....	20	12 to 30	504	20.16	.67 ct. per hr.	By Syndicate outfit
Threshing	....	....	....	....	....	....	....	....	By steam

Total Kw-hr.....6,954
Excess.......... 520
For Silo-Filling.. 504

Cost to user = ...$124.96
Average cost per Kw-hr. = 1.63 ct.
Excess and Silo-Filling 4 ct. per Kw-hr.

Farm No. 2

Operation	Time: Times used per Year	Time: Used Each Time	Time: Total Hr. per Year	H.P. of Motor	Current: Demand in Kw.	Current: Kw-hr. for the Year	Cost: Total	Cost: Unit	Notes	Rate-Service charge, $3 per month Power charge, $30 per H.P. per Year Excess, 4c. per Kw-hr.
							$ c.			
Milking	730	1 hr.	730	3	1.7	1,241	32.27	.21ct. per cow per milking	15 to 30 cows	Average cost per Kw-hr. for all uses, excepting that of the syndicate motor 2.6 cts.
Grinding	52	3 hr.	156	5	3.75	525	13.65	.455 ct. per bush.	3,000 bush	Average cost per Kw-hr, for all the uses 2.8 cts.
Separating cream	....	....	....	....	....	....	....	....	Whole milk sold	
Sawing wood	3	4 hr.	12	5	3.75	45	1.17	3.9ct. per cord	30 cords stove wood size, rails & branch's	
Pumping	183	5 hr.	915	2	.8	732	19.03	2.8ct, per hour	From 220 ft. well	
Threshing	....	....	....	25	20 to 25	322	12.88	.4ct. per bush.	Approximately 3,500 bush	
Silo-Filling	....	....	....	25	2 to 30	402	16.08	75ct. per ton	16 ft. by 45 ft. silo.	
Heating Water	200	8 hr.	1,600	....	.6	960	24.96	62ct. per gal.		
Vacuum Cleaner	12	1 hr.	12	$\frac{1}{8}$	.12	1.5	.04	33ct. per hr.		
Electric Iron	52	4 hr.	208	....	.5	104	2.70	1.3ct. per hr.		
Washing	52	.5 hr.	26	$\frac{1}{8}$	.12	2	.05	.013ct. per hr.		
Lighting	....	....	....	....	....	....	....	2.6 per Kw-hr.		

Total Kw-hr	5,180	
Excess Kw-hr.	500	(Est'd)
Kw-hr. for Silo-Flling	402	
Kw-hr. for Threshing	322	

Farm No. 3

Operation	Time			H.P. of Motor	Current		Cost		Notes	Rate—Service Charge, $3.00 per Month. Power Charge—$3.00 per H.P. Year. Excess—4c. per Kw-hr.
	Times used per Year	Used Each Time	Total Hrs. per Year		Demand in Kw.	Kw-hr. for the Year	Total	Unit		
							$ c.			
Milking	660	.67 hr.	440	2	1.7	748	19 00	.18ct. per cow per milking	12 to 20 cows	Average cost per kw-hr. for all the uses, excepting that of the syndicate motor, 2.54ct.
Grinding	12	7 hr.	84	5	3.75	315	8 03	47.0 ct. per bushel	1,700 bushels of oats ground	
Separating Cream	....	....	....	....	....	....	....	....	Whole milk sold	Average cost of all uses 2.65ct. per kw-hr.
Pumping	330	1.25 hr.	412	5	1.	412	10 46	2.54ct. per hour	From well 200 feet deep	
Sawing Wood	....	....	....	5	3.75	19	48	4.0 ct. per cord		
Threshing	....	....	....	25	....	216	8 64	.432ct. per bush.	Approx. 2,000 bush.	
Silo-Filling	....	....	....	25	....	178	7 12	5.6 ct. per ton	14 ft. by 35 ft. silo.	
Heating Water	250	8 hr.	2,000	....	.6	1,200	30 48	.61ct. per gallon		
Vacuum Cleaner	44	.5 hr.	22	1/6	.12	3	08	.36ct. per hour		
Washing	36	.5 hr.	18	1/6	.12	2	05	.28ct. per hour		
Electric Iron	44	4 hr.	176	....	.5	88	2 24	1.27ct. per hour		
Lighting	....	....	....	....	....	1,649	41 88	2.54ct. per kw-hr.		

Total Kw-hrs.	5,224
Excess Kw-hr.	674
Kw-hr. for Silo-Filling	178
Kw-hr. for Threshing	216

Farm No. 4

Operation	Time: Times used per Year	Time: Used each Time	Time: Total Hr. per Year	H.P. of Motor	Current: Demand in Kw.	Current: Kw-hr. for the Year.	Cost: Total ($ c.)	Cost: Unit	Notes	Rate—Service Charge. $3 per Month. Power Charge, $30 per H.P. per Year Excess-4c. per Kw-hr.
Milking	700	1.5 hr	933	5	1.82	1,274	42.57	.26ct. per cow per milking,	12 to 32 cows	Average cost per Kw-hr. for all the uses excepting that of the Syndicate Motor, 3.53c.
Grinding	36	3 hr	108	5	3.75	405	14.30	.65ct. per bush.	2,200 bushels	
Pumping	200	1.25 hr	250	2	1.	200	7.06	2.82ct. per hr.	From 180 ft. well	Average cost per Kw-hr. for all the uses 3.6 c.
Sawing wood	2	5 hr	10	5	3.75	37½	1.31	5.24ct. per cord.	25 stove wood cords (rails and limbs)	
Silo-filling	....	....	....	25	....	490	19.60	4.65ct. per ton	16 ft. by 45 ft. silos	
Threshing	....	....	....	25	....	321	12.84	.37ct. per bush.		
Electric Iron	52	4 hr	208	....	.5	104	3.67	1.72ct. per hr.		
Heating water	60	8 hr	480	....	.6	288	10.17	.85ct. per gal.	1,200 gal. heated	
Lighting	....	....	....	....	....	1,099	38.80	3.53ct. per kw-hr.		

Total Kw-hr.	4,218
Excess kw-hr	610
Kw-hr. for Silo-Filling	490
Kw-hr. for Threshing	321

Farm No. 5

Operation	Time			H.P. of Motor	Current		Cost		Notes	Rate—Service Charge $3 per month. Power Charge, $30 per H.P. per Year.
	Times used per Year	Used each Time	Total Hr. per Year		Demand in Kw.	Kw-hr. for the Year	Total	Unit		
							$ c.			
Vacuum Cleaner	10	1 hr.	10	1-6	.12	1.2	.07	.7ct. per hr.		Average cost per kw-hr. for Domestic uses 6.27c.
Washing	22	.5 hr.	11	1-6	.12	1.3	.08	.72ct. per hr.		Average cost per kw-hr. for all the uses 5.8c.
Electric Iron	40	4 hrs.	160	....	.5	80	5.31	3.3ct. per hr.		Cost for threshing & silo-filling 4ct. per kw-hr.
Silo-Filling						178	7.12	5.6ct. per ton	14 ft. by 35 ft. Silo.	
Threshing						180	7.20	....	No record.	
Lighting						1460	91.64	6.27ct. per kw-hr.		
						1900.5				

Total Kw-hr.	1,900
Excess Kw-hr.	0
Kw-hr. for Silo-Filling	178
Kw-hr. for Threshing	180

Individual Silo-Filling Outfits

Below are submitted notes on the individual outfits that were used for silo-filling. The type is noted in each case.

East Oxford Township—Farm No. 1

At this farm a small blower outfit was used, having automatic feed table, roller feed control, etc., driven by 5 horse-power motor.

Silo No. 1 14 ft. by 32 ft.
Silo No. 2 12 ft. by 32 ft.
Height to elevate 28 ft.
Amount put in—full.
Length of cut ¾ in.

As the filling was not rushed, they were both filled, but no refill. Corn was cut before filling was started, being taken from the ground and not from stooks.

The outfit was set for 6 days, running approximately 8 hours per day—a total of 48 hours for the 2 silos. 2 teams and 4 men were at work for 4½ days, and 3 teams and 5 men for 1½ days.

No meter being available, as this installation was made just previous to the silo-filling, the current used had to be approximated and was estimated at 205 kilowatt-hours.

The demand—average per minute—had also to be approximated from former tests on similar outfits and was estimated at 4½ kw.

The cost for current for the filling of these two silos at 4½c. per kilowatt-hour would be $9.22 on the assumption that all of the current would be paid for. As a matter of fact, only 60 per cent of this current was paid for as that proportion would be the amount which would be taken in excess of the 2 horse-power contract which is in force at this place. Therefore. the cost for excess while filling these two silos would be $5.54.

West Oxford—Farm No. 1

At this place the carrier type of outfit was used, driven by a 5 horse-power motor running at 1,420 revolutions per minute.

Silo 14 ft. by 35 ft.
Height to elevate 21 ft.
Length of carriers from heel to top 32 ft.
Amount put in full and refilled 5 times.
Total, approximately 100 loads.
Length of cut 1 in.

Amount of current used not noted, but approximated from the total used in that month and the total that was used for filling last year—58 kilowatt-hours.

The cost for the current for filling this silo at 4½c. per kilowatt-hour would be $2.61. As a matter of fact, under the 2 horse-power contract, only 60 per cent. of the amount of current taken would have to be paid for as excess, which would amount to $1.57.

The results at this place were exceedingly satisfactory.

This is the third year that this outfit has been used, and practically no outside labor has been used any of these years in assisting filling, the work being done by the owner and hired men with one team, the time varying from 5 to 7 days, depending on the weather and the distance from silo to field.

Dereham Township—Farm No. 1

A carrier outfit was used at this place driven by a 5 horse-power motor running at 1,420 revolutions per minute.

Silo 14 ft. by 35 ft.

Height to elevate 25 ft.

Length of cut ¾ in.

Length of carriers 40 ft.

The carriers were set at right angles to the delivery from the box, being operated through a jack.

The results at this place were not very good. Considerable difficulty was experienced in the operation of the jack, as well as with the box, the trouble with the box apparently being that the shaft was set out of centre at one end so that the alignment of the fly wheel and the frame were not true, resulting in the wheel rubbing against the frame during a part of the time.

This was another installation which was made in a rush at the beginning of the silo filling period, and no meter was available to take records. The amount of current used was approximated from results with this type of box, making some allowance for the extra load in the form of the jack and the friction which was due to the poor alignments of the parts of the box, 65 kilowatt-hours being used. This, at 4½c. per kilowatt-hour cost $2.93. The excess in the case of the 2 horse-power contract would amount to $1.76.

The box giving trouble at this place interfered with the regular arrangement that was intended to be made, that is, this man and his brother, with one or two hired men, depending on the work at their farms, would take care of the filling. The corn was all cut previous to the starting of the filling and was picked up from the ground in bringing to the silo. None of it was stacked.

The time filling was not noted because of the interruptions due to trying to make arrangements to have the faults of the box corrected.

London Township—Farm No. 1

At this place a carrier type of outfit was used, driven by a 7½ horse-power motor which was the motor that was available. A 5 horse-power would have done just as well.

Silo 11 4-12 ft. by 29 ft.

Height to elevate 26 ft.

Length of cut ¾ in.

38 ft. of carriers were permanently installed along the end of the barn making a right angle delivery through a hopper into the silo. This was covered with sheet steel covers, hinged so as to make access to the carriers easy in case of necessity.

The filling was done between times by the men on the place, the gang usually consisting of two to pitch and one on the load. The man for feeding the box coming from the field with each load.

The results were exceedingly good, no trouble being experienced with either carrier or box.

The time for filling was part of each of 4 days—approximately 28 hours total, not including refill which was made later, in doing which a few loads were brought in whenever it was found that the silo would take them.

The amount of current that was used had to be estimated, as the meter which is installed measures all the uses on the premises. It was estimated that the total was 45 kilowatt-hours. This, at 4½c. per kilowatt-hour, would be $2.03.

North Norwich Township—Farm No. 2

At this place an elevator type of outfit was used, the box being a cylinder cut machine delivering the cut material into a hopper from which the elevators took it to the top of the silo, the outfit for elevating being similar to that which was used last year with the addition of an adjustment for controlling the tension of the chain, which was installed on the lower sprocket shaft. This equipment was driven with a 5 horse-power motor which is regularly used for the power needs in one of the barns, that in which a milking machine is installed and milking cows are kept.

Three silos were filled:
No. 1, 14 ft. by 35 ft.
No. 2, 14 ft. by 32 ft.
No. 3, 14 ft. by 35 ft.
The length of cut being ½ in.

Height to elevate being the full height of the silo in each case.

The time for filling No. 3 was 6 days, the labor 7 men and 3 teams. The results were exceedingly satisfactory, although some trouble was experienced through the breaking of one of the castings on the box which was new.

The amount of electricity used was approximated from the readings which were taken at the one place, the total being 168 kilowatt-hours for the 3 silos which, at 4½c. per kilowatt-hour, amounts to $7.56.

As a 2 horse-power contract is in force at this place, the amount of current which had to be paid for is in excess only over and above the amount of contracts, being $4.54.

NOTE.—This includes refill on two silos, but not on the third.

North Oxford—Farm No. 1

The outfit that was used at this place was the carrier type, the carriers being new apparatus this year, the box being one that has been on the place for a good many years.

Silo 16 ft. by 42 ft.
Height to elevate 37.
Length of cut ¾ in.
Length of carriers 50 ft.

This was driven by a 5 horse-power motor which was belted temporarily to the box alongside the silo.

The results were very good, no trouble being experienced with the carrier or motor. Owing to the box being old and the knives being used for a considerable length of time there was some little trouble in keeping the knives sharpened, probably due to the fact that the temper had been drawn out of them by constant sharpening.

This outfit was set for approximately 2 weeks, filling being done at intervals as found convenient, but so arranged that no mould formed on the corn.

The results were satisfactory to the owner, the only objection that he raised was that he thought perhaps a larger motor would be better. In this there is little doubt that he was mistaken, as the fault was in the box. By overhauling the box, correcting the faults in the bearings and other points where there was undue friction, there is no doubt but that the results would be as good with a 5 horse-power motor as with the 7½.

It is estimated that the amount of current used was 210 kilowatt-hours which, at 4½c. per kilowatt-hour would cost $9.45. As this place is being served under a 2 horse-power contract only the current which was taken in excess of the contract must be paid for as excess. The amount for the excess at the same rate per kilowatt-hour was $5.67.

In addition to these, there were a few other places on which individual silo-filling outfits were reported as being used, but on which no notes were obtained.

The details submitted in notes were taken in each case by the man operating the outfit, and therefore are only general. The amount of the cost as indicated by the kilowatt-hours that are estimated as being used is close enough for estimating purposes, under similar conditions, on any farm, as these computations are based on notes that were taken during the period of silo filling last year with similar equipments.

MUNICIPAL UNDERGROUND CONSTRUCTION

The report for the preceding year stated that eleven municipalities had consulted the Commission with regard to their Underground Systems, and that a considerable amount of construction work had been undertaken under the Commission's supervision. During the past year eleven other municipalities have been added to this list and have received advice pertaining to underground construction and ornamental street lighting, these two questions often being considered together.

Attention is called particularly to the Joint Conduit System, which has been successfully completed in Hamilton, and to the underground distribution system which has been installed in Kingston in conjunction with the removal of unsightly wooden poles. In ornamental street lighting the recently developed nitrogen-filled lamp has been utilized to advantage and complete installations of these lamps were made first in Hamilton and Stratford, of the multiple and series type respectively. The installation of ornamental lighting on the streets of Windsor is notable in that practically the whole of the city is illuminated by ornamental standards fed by cables laid underground.

A brief description of the work in each municipality follows:—

Baden

Conduit, lead covered cable and cable terminals were supplied and installed for a 4,000-volt underground service supplying the plant of the Dominion Linseed Oil Company at Baden. The installation was made in December, 1913.

Belleville

Following a request from this municipality for advice regarding a new street lighting system, the Commission made a study of the installation which the local distributing company proposed to supply. While the new system was to cover the whole city, the section of most interest was the "White Way" for Front and Bridge Streets. This consisted of 44 ornamental standards with pendant fixtures enclosing 500 watt, gas-filled, tungsten lamps.

Due to the Commission's efforts the municipality was enabled to obtain a reduction of $13.85 in the annual charge for each of the above lighting units.

The installation was completed in September, 1914.

Berlin

During the year Berlin has been supplied with materials for underground construction, including conduit, lead covered cables and cable terminals, also a subway type transformer.

Galt

The ornamental street lighting system has been considerably extended during the year. There are now in operation 191 single-light standards, 28 three-light clusters, 10 five-light clusters, and 22 four-light brackets mounted on street railway poles.

Work is now under way on Main and Dickson Streets, where single-light units with 500 watt, nitrogen-filled lamps will be installed.

Guelph

A change in the ornamental lighting on the main street is under consideration with the object of increasing the amount of illumination. Nitrogen-filled lamps will probably be used to replace the existing vacuum lamps. A report on the increased annual cost by reason of the change is now being prepared.

The municipality is also considering the installation of ornamental lighting on one of the residential streets.

Hamilton

The work on the Hamilton Underground Conduit System, which was commenced in September, 1913, was completed in June, 1914. This system was constructed in accordance with orders issued by the Board of Railway Commissioners for Canada and the Hydro-Electric Power Commission, and was installed by the municipality for the joint use of the Hamilton Hydro-Electric Department, the Hamilton Cataract Power, Light and Traction Co. and affiliated companies, the Canadian Pacific Railway Telegraph Co., and the Great North Western Telegraph Co.

The conduits are laid under streets over a distance of 8 miles, the total number of feet of conduit laid was 744,827 of which 553,205 feet were clay conduit and 191,622 feet were fibre conduit; 237 manholes were constructed, including a number of transformer vaults; 376 Service Boxes were built and 704 entries made into consumers' premises.

The Hamilton Hydro-Electric Department has already made use of the system and has installed approximately 156,000 feet of cable.

Hamilton has also installed in conjunction with the above work a "White Way" consisting of 402 ornamental cast-iron standards of original design supporting pole top fixtures which enclose 500 watt, nitrogen-filled lamps. These lamps were put into operation on July 1st, 1914.

Kingston

The conduits for the underground system were laid during the period from September to December, 1913, and the drawing in and jointing of the cables followed without delay. Steel poles were erected to replace the existing wooden poles used for supporting the span wires of the street railway. On the steel poles ornamental brackets were mounted supporting magnetite arc lamps.

On certain streets where railway poles were not required there were erected ornamental standards with magnetite arc lamps.

The whole of the commercial district is covered by the above system.

In this district all street lighting circuits, power and lighting feeders and services to private consumers are now carried in the underground conduits, and the appearance of the streets is thus greatly improved.

Approximately 55,000 feet of clay ducts and service pipes were laid; 28 manholes and 99 service boxes were built; service pipes were run to 254 consumers and to 96 street lighting units; 42,240 feet of cables were laid in the ducts for various circuits, including street lighting, power and lighting primaries and secondaries and service taps to consumers, and street railway feeders. All the cable was installed by day labor. After the cables were connected together a careful test was made to determine the conditions, due to current from the street railway system. which might injuriously affect the cable. Following this precautions were taken to avoid damage from the electrolysis.

Kingston—Princess St. before Removal of Overhead Wires

Kingston—Princess St. after Removal of Overhead Wires

Street Lighting Standard—Belleville

Street Lighting Standard—Stratford

In addition to the above 90 railway poles and 36 ornamental standards were erected by day labor.

The total number of arc lamps installed is 96; these are spaced at 140 feet apart and "staggered" thus providing an exceedingly good distribution of light. The lamps are mounted on the trolley poles at 16 feet from the ground and on the ornamental standards at 14 feet 6 inches from the ground. The lamps are of the direct-current luminous arc type and are fed from two 50-light rectifier sets placed in the substation.

As fast as the services to consumers were changed from "overhead" to "underground", the overhead wires were removed, and as the telephone poles and wires and the wooden poles of the street railway had been previously removed, the streets were thus left with a minimum of overhead construction.

The estimated cost of the whole work was $60,600, and the actual cost $60,134.

London

An inspection and report was made in February, 1914, on the existing underground conduit system for the purpose of determining how this system could be utilized in the event of all the poles and overhead wires of the various electric power and signal companies being removed from the streets throughout the downtown district.

The municipality was advised of the conditions under which the existing ducts could be used as a joint system containing the cables of the different companies.

Investigation was also made as to the possible disposition of the main and distributor lines of the telegraph, telephone and lighting and power systems.

Some preliminary work has been done looking to a general improvement in the street lighting system both in the commercial and residential districts.

Midland

The municipality of Midland has applied to the Commission for plans and estimates for an underground system of street lighting and general power distribution. Installation will probably be made during 1915.

Paris

The underground conduit work mentioned in last year's report was completed in January, 1914. The work included a 15-duct "run" of clay conduit with concrete manholes, which connected the substation with the aerial lines. Lead covered cables providing for 3 feeders for street lighting, 3 feeders for general lighting and power and 2 feeders to the waterworks were laid in these ducts.

The installation of the ornamental lighting standards for Grand River Street has been temporarily delayed, but will probably be proceeded with during the coming year.

Port Arthur

A request was received from the Port Arthur Commissioner of Utilities during the past year for a recommendation in connection with an ornamental system of lighting for the streets of Mariday Park.

After investigation a recommendation was submitted specifying the type of lighting standards and the method of feeding them, accompanied by an estimate of the cost of the installation.

The property owners are to be assessed on the Local Improvement plan and it is expected that the system will be installed during the coming year.

Preston

Plans and estimates for alternative systems of ornamental street lighting were prepared and forwarded to the Municipality during the year. A nitrogen filled type of lamp operated on a series circuit was proposed.

These lamps may be mounted on ornamental standards and "fed" from an underground cable, or else may be mounted on ornamental brackets placed on street railway poles. If the latter suggestion is adopted new steel poles will be erected jointly by the Municipality and the Railway Company and the lamps supplied with current either by an overhead wire or an underground cable.

It is quite probable that this work will be installed in 1915. The initial installation will extend along Main Street, for 2,170 ft., and ultimately the system will be increased to slightly more than 6,000 feet.

Renfrew

Estimates and plans have been prepared and submitted to the municipality of Renfrew for a new and complete system of street lighting, including a "White Way" installation for the Main Street. Several ornamental standards have also been installed to show the type suggested for the "White Way."

The By-law authorizing the raising of the necessary funds was passed by a large majority on July 15th, 1914.

Owing to the unfavorable financial conditions which ensued shortly thereafter, it was decided to postpone the work for the time being. However, as the improvement is much needed it is not likely that installation will be long delayed.

St. Catharines

Information relative to various types of ornamental street lighting standards both for commercial and residential districts as well as the best methods of feeding the standards by underground cables has already been supplied to St. Catharines, and several standards sent to the Municipality and erected complete with fixtures for exhibition. Annual and capital costs were also estimated for the various systems proposed.

A choice is to be made in the near future from the different propositions suggested, and St. Catharines is assured of the latest developments in street lighting systems.

St. Thomas

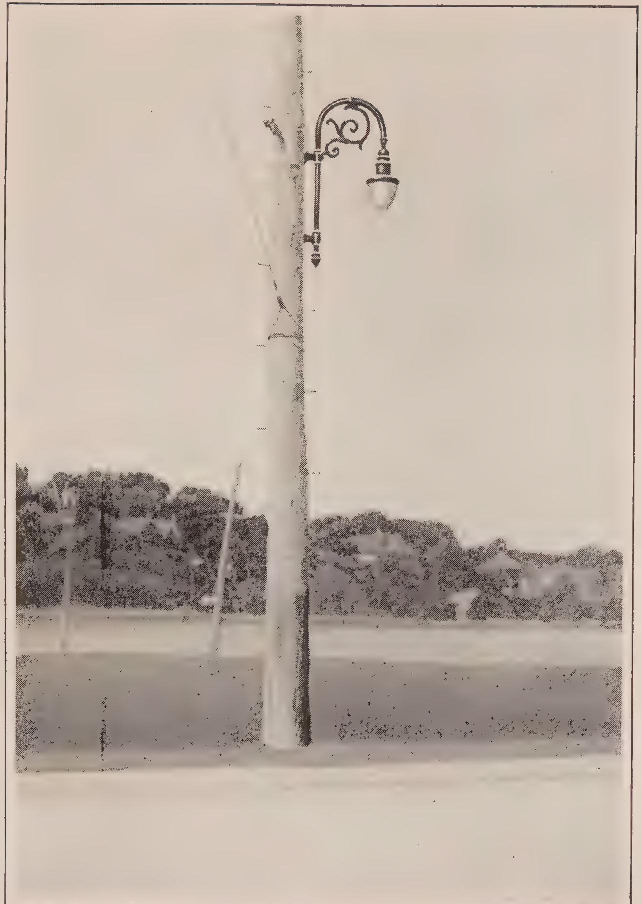
The St. Thomas Hydro-Electric Commission in July, 1914, decided to make a change in the lighting on Talbot Street and the rearranging of the system was placed in the hands of the Commission. The equipment for the new system has been ordered and installation work will be commenced shortly.

The section to be improved is from Alma Street to Stanley Street on Talbot Street. The plans include the removal of all existing overhead wires, excepting only the trolley wires and cross spans. All wooden poles are to be removed and combination railway and lighting poles of tubular steel will be erected. A total number of 106 poles is required, each of which will support a lighting bracket in addition to the trolley wire. The brackets are to be of the "Bishop's Crook" type of special design embodying the St. Thomas Municipal Coat-of-Arms, with pendant lamp fixtures.

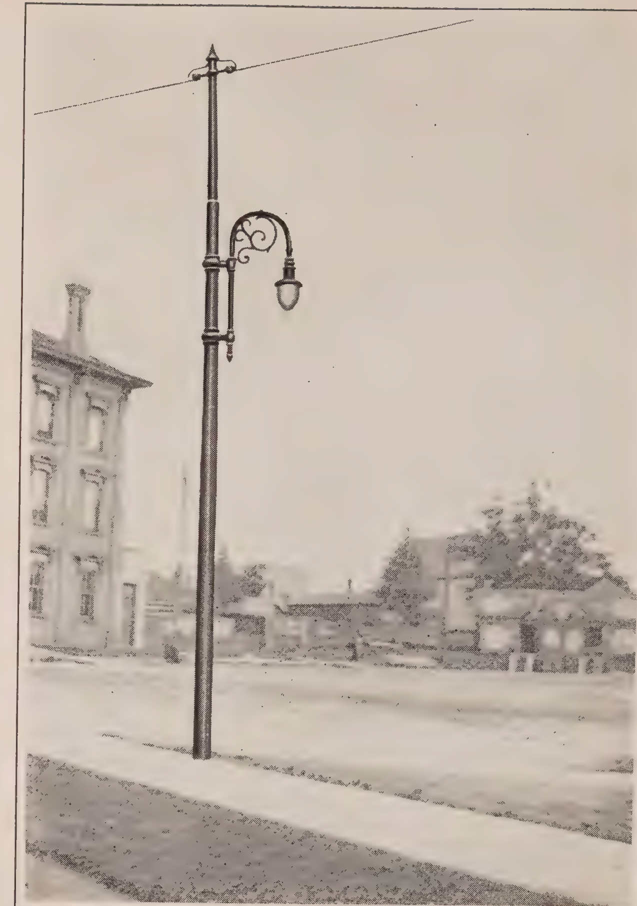
Nitrogen-filled 500 watts series lamps, mounted 16 feet from the pavement are to be used and will illuminate one mile of the Main Street, covering most of the commercial district. In the near future the street lighting in all parts of the City is to be improved.

Lighting Standards on Main Street—Galt

Residential Street Lighting—Galt



Lighting Unit on Wooden Pole—Stratford



Combination Railway and Lighting Pole—Stratford

Stratford

A By-law was passed in Stratford on May 18th, 1914, authorizing the expenditure of $22,000 for improvements to the street lighting system, and the removal of wooden poles and overhead wires from the main streets in the central part of the city. Equipment was ordered and actual work of installation started on July 6th and the lighting system was completed and placed in service on 31st of July.

This work included the installation of 11 ornamental lighting standards about the City Hall, which were supplied with current from lead covered cables laid underground in fibre duct; also the erection of 164 steel poles which are to serve the double purpose of supporting the street railway span wire and the ornamental street lighting bracket. This latter is mounted with the lamp 16 feet from the ground; the lamps on the poles and on the standards being at the same height. The bracket is of the same design as the upper part of the standard so that the two units are similar in appearance.

The lamps on the railway poles were fed by a single overhead wire, which is inconspicuous, and thereby permits the extension of the system over a greater length of street than would have been advisable if it had been necessary to install underground cable.

The lamps are of the nitrogen-filled type, 500 watts, operating on 6.6 ampere circuit. Three constant current transformers were installed in the substation to provide for the increased load and the lamps are so arranged that two circuits are cut off at midnight, thus effecting a great saving in lamp renewals. Provision is made for the operation of enough lamps on the "all-night" circuits to light the streets sufficiently after midnight.

Poles are being erected in the rear of the buildings for the purpose of serving private consumers, while the old wooden poles are being removed from the main streets as the work in the rear progresses. The cost of the work completed to date is well under the estimate.

Welland

Additional submarine cable and terminals were supplied for a crossing under the Welland Canal in order to deliver power to Grantham Township.

Weston

At the request of the Municipality of Weston the Commission made a study of the question of ornamental lighting for Main Street. Following this a recommendation was made for 22 single-light units, using a gas-filled lamp operated on a series circuit.

An estimate of the cost, with plans, was also submitted to the local Commission, and it is expected that the installation will be made shortly.

Windsor

Windsor has now in the course of installation a system of ornamental street lighting which has many points of interest, and which in some respects is unsurpassed. Practically every street in the city is to be illuminated by ornamental lighting standards fed by underground cable. The poles and wires required to serve private consumers are being placed at the rear of the buildings, in the alleys.

Original designs of cast iron lighting standards were prepared and the greater part of these were obtained from a local foundry. The total installation will require 1,500 standards and over 60 miles of cable. The cable consists of a single No. 6 B. & S. guage copper wire with paper insulation and a lead cover protected by steel tape armor and jute.

Two types of standards are being used. In the downtown section the type chosen consists of a cast iron fluted column supporting a pole top fixture. The fixture encloses a 750 candle-power nitrogen-filled series lamp in a large diffusing globe. The mounting height of the lamp is 14 ft. 6 in. above the pavement and the equipment has produced an exceptionally effective "White Way."

For the remainder of the city a standard of similar general design but smaller dimensions is used. The fixture will contain a 150 candle-power nitrogen-filled series lamp. The standards are placed on both sides of the street and staggered, and are further arranged so that opposite sides of the same street are on different circuits.

Up to the present time 1,300 concrete bases have been set, and 1,000 standards erected, while approximately 40 miles of cable has been laid. All this work has been performed by local day labor under the supervision of the Commission. The costs, which are to be borne by the property owners on the Local Improvement Plan, have been exceedingly low.

ELECTRIC RAILWAY PROJECTS

General

The work carried on by the Electric Railway Department during the past year may be summarized as follows:—

1. Advice to municipalities as to possibilities, routes, etc., of proposed lines.
2. Reconnaissance and rough reports on various lines.
3. Preliminary surveys of desired routes.
4. Preparation of plans and profiles of preliminary surveys and projection and taking out of quantities on lines along such surveys.
5. Estimates of cost of construction and equipment of proposed lines.
6. Collection of traffic data from the various districts showing the amount and distribution of business both inbound and outbound.
7. Estimates of the annual revenue and expenses that might be expected from the construction and operation of various lines.
8. Reports and advice to municipal committees and representatives as to the most profitable routes of those surveyed through various districts.
9. Assistance to municipalities in the preparing of by-laws and presentation of such to the ratepayers for ratification.
10. Preparation of standard estimating costs of each portion of the work entering into the construction of the complete line.
11. Preparation of standard rules and specifications with drawings covering the forms of construction proposed for these lines.
12. Preparation of specifications and plans covering standard materials such as rails, concrete pipe, etc., required for roadbed construction.
13. Selection of a system of electrification.
14. Compiling statistics of traffic, revenue and expenses of existing railways for the purpose of comparison with proposed lines.
15. Preparation of specifications for electrical equipment for substations, cars and locomotives.

To carry on the above work in all its details required a very careful and complete study of plans, costs and operating statistics of existing railways now in operation in Canada, United States and Europe.

Projects

To date, resolutions have been received from 138 townships, 38 villages, 42 towns, 11 cities, 4 police villages, and 7 miscellaneous committees, such as Boards of Trade, etc., asking for surveys, reports and estimates on proposed lines. Two survey parties have been at work for almost the entire year making preliminary surveys of some 1,200 miles of line. The information so obtained has been plotted and used for the purpose of preparing estimates on the cost of roadbed construction. In making the surveys topography was taken for approximately 400 ft. on each side of the traverse line. When this information was plotted the proposed lines were then projected and quantities figured along such lines.

Traffic men have been sent into the various districts for the purpose of collecting information showing the amount of freight and passenger business that is obtained by the present railways in the district, and whose duties are to estimate on the business that may be done by the proposed lines. Full information is now being taken by these men showing not only the amount of business, but the

revenue that is derived therefrom and the destination or shipping point of freight business; thus the information may be used for other lines that may be proposed in the future without requiring the traffic men to return to the district.

The most important work done during the year was in the Toronto-North-Eastern District. Meetings with the representatives of the municipalities in this district were attended during the year, and it was decided by the representatives during the summer that the councils of the municipalities should pass by-laws to cover the construction, equipment and operation of the line, and that these by-laws should then be placed before the people on October 19th for ratification. Agreements between the Commission and the municipalities covering construction and operation of the line were prepared and a number of meetings were held in all centres throughout the district, for the purpose of explaining the proposition to the ratepayers. Representatives of the Commission were present at practically all of these meetings to assist in giving this information, and the result of the voting on October 19th showed that the municipalities as a whole were very anxious for the construction of the line along the route recommended by the Commission. Eleven out of the thirteen municipalities that voted on this date passed their by-laws by very substantial majorities.

TESTING AND RESEARCH LABORATORIES

During the past year the work of the laboratories has increased greatly both in volume and in variety, due to the rapid expansion of the Commission.

The installation of the equipment originally planned has been practically completed, and in addition, a complete equipment for conducting physical tests on cement has been installed, which is described in greater detail below.

As mentioned in previous reports, the organization includes the High-Tension and General Testing Laboratory, Lamp Testing Laboratory, Meter and Standards Laboratory, and Illuminating Engineering Laboratory. There is also a fully equipped dark room in connection with these laboratories, in which photographic work is done for the various departments of the Commission. This is also of great value to the laboratories in making possible photographic records of tests of special interest.

The laboratories have been placed on a self-supporting basis by the adoption of a scale of charges slightly in advance of cost, which applies to other departments of the Commission, and to municipalities and others for whom tests are made.

The outline given below of the equipment and of the nature of the work undertaken by the various sections, will indicate in some measure the variety of tests which the laboratories are prepared to handle:—

Electrical Equipment of the Laboratories

The electrical equipment necessary for widely differing classes of work done in the departments of the laboratories has been selected and installed with a view to promoting the greatest flexibility of use, thus enabling one piece of apparatus to be used for as many different classes of work as may be consistent with the accuracy required.

The power used in the building is fed directly from the Strachan Avenue Substation at 13,200 volts through an underground cable to transformers located in a special room in the basement of the laboratory building. The transformer equipment comprises three 50-kv-a. units so connected that three-phase power may be obtained from them at 220 or 110 volts. This power is carried through a set of interlocking oil circuit breakers to the laboratory switchboard, situated in another part of the basement. The switchboard, of special design, consists of seven panels, each for its own separate and distinct class of work, and includes, besides the necessary switches and circuit breakers for distributing power to all parts of the building, an arrangement whereby testing circuits in different departments of the laboratories may be interconnected, thus avoiding a large quantity of temporary wiring when special tests are conducted. This board also carries meters for indicating and recording all incoming power; contact making voltmeter and relays for the voltage regulator; and the terminal jacks of the storage batteries and other direct current circuits.

The battery charging set, and a 50-kv-a., 60-cycle motor generator set, for use with the high voltage testing transformer are installed in the same room with the switchboard. The storage battery layout, located in a room near the transformer room, is made up of two separate sets, 70 cells each, of 80-ampere-hour "Tudor" cells. Provision having been made on the front of the main switchboard for any desired interconnection between these batteries, a wide assortment of direct current is available for all work where a source of steady potential is required.

A detailed description of the special pieces of apparatus will be found under the heads of the separate departments in which they are used.

High-Tension and General Testing Laboratory

The high-tension section of the laboratories is at present equipped with transformers and connecting equipment suitable for making high potential tests at any voltage from 1,000 to 400,000 volts 60-cycles, and up to 225,000 volts at 25-cycles. Sixty-cycle power for this purpose is supplied by the 50-kv-a., three-phase alternator mentioned above. It is wound to give a normal voltage of 1,100 or 2,200, and is driven by a 75-h.p., three-phase, 220-volt induction motor. Excitation for the alternator is provided by the battery charging set. The high-tension testing set consists of two transformers wound to give 75,000 volts and 300,000 volts respectively.

This high-tension set is used for making dielectric tests on transformers, transmission line materials, series lighting fixtures, or any other high voltage electrical apparatus. Considerable time and much study is devoted to high-tension transmission line troubles, especially of line insulators, both pin and suspension types, and much valuable information has been obtained. In several instances this has led to changes in design of insulators by the manufacturers, and, in a word, has had a salutory effect upon the manufacturers in causing them to exercise greater care in factory processes, in order to get a more perfect product.

Under this department, tests have been performed on several types of 13,200-volt power fuses under severe operating conditions, the tests being made with large generating and transforming capacity and 100 miles of 110,000-volt and 25 miles of 13,200-volt line in the test circuit. The ability of the fuses to open a "dead short" across the 13,200-volt bus was investigated, and observations taken of the attendant phenomena by means of the oscillograph and the camera. An oscillographic record of one of these tests is shown below.

A certain percentage of the small transformers purchased by the Commission are tested before being put into service, and this has led to frequent eliminations in the laboratory of transformers which would have broken down in service, and caused delay, dissatisfaction, and expense to the customer.

Mechanical as well as electrical tests are made on insulators, apparatus being at hand capable of subjecting them to a mechanical tension of 10,000 pounds, and, if desired, an electrical stress of 100,000 volts or more. This mechanical apparatus is available for any tension tests up to 10,000 pounds.

Many miscellaneous tests are carried out here for which special apparatus is designed in the Laboratory Workshop. Also, many tests, while not determining absolute values, do nevertheless determine comparative suitability of material for the work for which it is to be used. Among miscellaneous tests performed recently may be mentioned the following:—

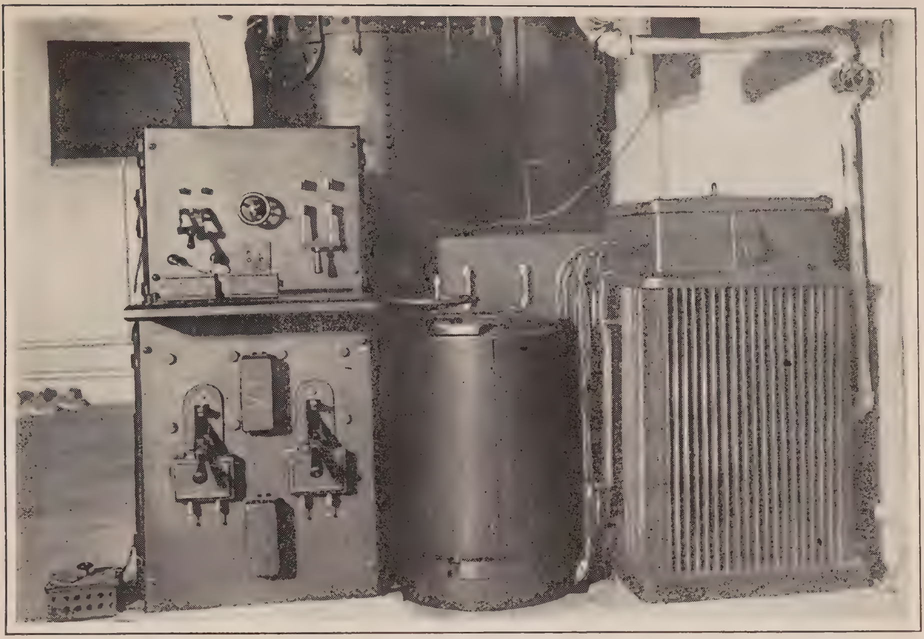
Determination of the relative expansion of porcelain and various metals and alloys, glass and cement.

Determination of the relative heat conductivity of various patent car floorings and sidings as compared with wood and dead air space as a heat insulator.

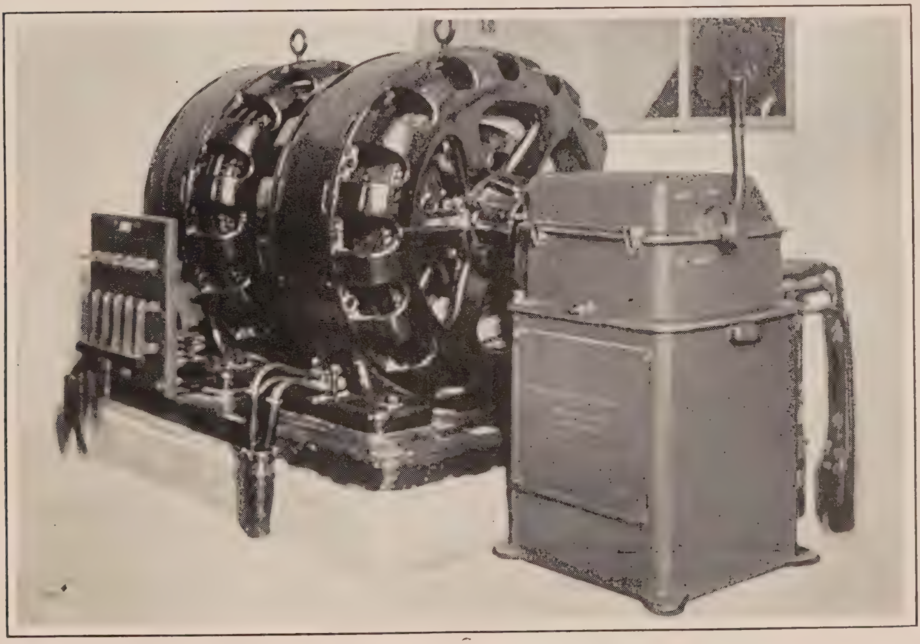
Tests on hot galvanizing and sherardizing as a rust proof covering for iron, and tests to determine whether or not purchases of galvanized hardware will pass the standard four-dip test.

Connected with this section is the Cement Testing Laboratory, in which four to five samples per day of cement may be tested. Samples are tested according to the specifications of the Canadian Society of Civil Engineers, for the following:—

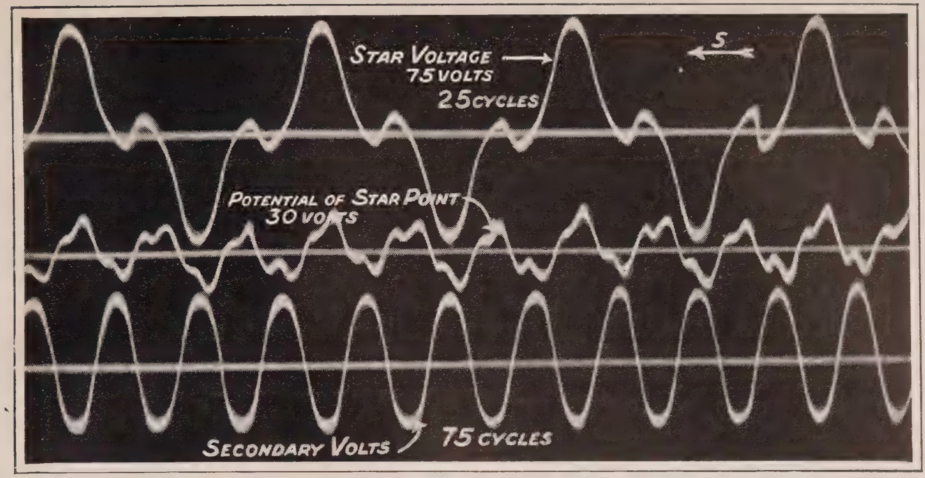
1. Fineness.
2. Time of Setting.
3. Tensile Strength.
4. Soundness and Constancy of Volume.



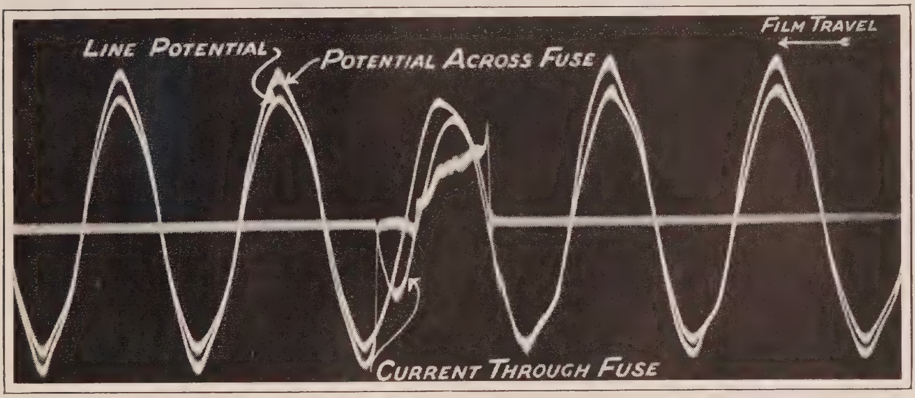
Control Board for High-Tension Testing Transformers—High-Tension Laboratory



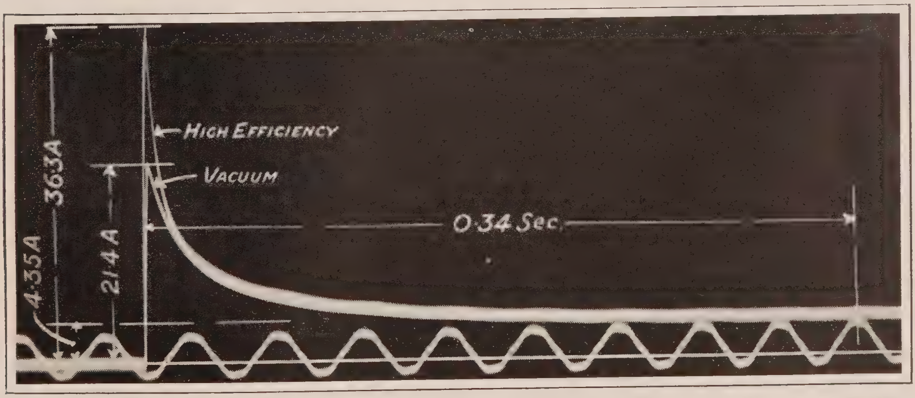
50 Kv-a., 60-Cycle Motor Generator Set—High-Tension Laboratory



Oscillogram Showing Conditions in 75-Cycle Frequency Changing Transformer



Oscillogram of Short-Circuit Test on 13,200-Volt Fuse



Oscillogram Showing Comparative "Overshoot" of Nitrogen and Vacuum Lamps

Any sample not passing test, or which gives a doubtful test, is at once given a check test, reserve cement for such contingencies being labelled and stored at the time the cement is received at the Laboratory. The reserve samples are preserved until the cement has been accepted by the Commission.

Meter and Standards Laboratory

By the installation of improved apparatus, the scope of the work of the meter department has been greatly increased from previous years, and a large amount of electrical testing extremely varied in its nature has been accomplished.

The equipment has been chosen with a view to the widely varied classes of testing which are likely to come within the sphere of this department. Where extremely close voltage regulation is not required, 25-cycle power is obtained from the supply mains of the building; while 60-cycle power of the same class can be taken from the 50-kw. motor generator set installed for use with the high-tension testing transformer. For precision work, a specially designed motor generator set has been installed. It consists of a direct-current variable speed motor driving a small alternator. From this alternator may be obtained two or three-phase potentials at any voltage up to 360, while by changing the speed of the motor, any frequency from 22 to 66 cycles can be maintained. Direct-current is taken from the storage batteries or from the charging generator.

A number of new meters have been added to the stock of portable measuring instruments. Among these may be mentioned:—A "Frahm" type, vibrating reed frequency meter; several of the newest Weston, volt, ampere, and watt meters; and a Nalder power-factor indicator for unbalanced three-phase loads. An attachment has been purchased for the oscillograph, which enables records five feet long to be taken, whereas formerly the limit of length was twelve inches.

Where electrical power is measured for sale, the necessity arises for accurate standards of measurement, against which may be checked the sub-standards used in calibration of station graphics and other power meters. The official standards of the Dominion of Canada are of course in the custody of the Government, in the laboratories at Ottawa. With a view to leaving absolutely no room for conjecture as to the accuracy of measurements, a careful comparison has been made of the Commission's standard instruments with those of Ottawa, and also indirectly with the United States standards at Washington.

The "Hydro-Electric Meter Code," the compilation of which was referred to in last year's report, has been adopted as a basis of comparison of watt-hour meters, and a number of different types were submitted for comparison of their mechanical properties. A very close check having thus been obtained on the actual relative values of widely differing makes, a basis was established whereon to place large contracts for the instruments as required by the municipalities. The following meters have been submitted to these tests:—

Aron	Packard
Canadian General	Siemens
Chamberlain and Hookham	Sangamo
Ferranti	Westinghouse

The peculiar characteristics of the demands of rural customers, which now form a rapidly increasing percentage of the Commission's power load, has called for special types of metering apparatus to replace or to be used in conjunction with the ordinary watt-hour meter. Experiments have been conducted on various metering principles which might answer these requirements, and a number of types of

excess and maximum demand meters are now being given actual service tests to further determine their characteristics.

A large number of watt-hour meters purchased for the municipalities have passed through the meter testing department before being sent out. The investigation of these enables the Commission to keep a check on the product. Such meters as are to be used in the district immediately surrounding Toronto are here inspected and sealed by the Dominion Government inspector. On occasions, municipalities on the 60-cycle portions of the System have been enabled to secure at very reasonable rates, meters and such apparatus formerly used by customers, who, tying in with the Niagara System, must replace their 60-cycle equipment with 25-cycle. The Stores Department acting as a clearing house for such apparatus, the Laboratory is enabled to inspect, and if necessary, adjust it before it passes on to the new owner.

With a view to determining the best value obtainable in heating utensils, very detailed tests were performed by this department on cooking ranges, toasters, sad irons, and other heating appliances. These tests included prolonged runs under actual service conditions, as well as careful investigation of the operation when subjected to the abuses which are likely to fall to the lot of such apparatus in domestic use. In the case of the cooking stoves, the tests included actual cooking of meals, records being kept of power consumed, time of cooking, quality of product, cost per person per meal, etc.

The following makes of utensils were submitted to test:—

COOKING RANGES

Copeman	Hughes
Hot point	Ideal
General Electric	Parke (Automatic)

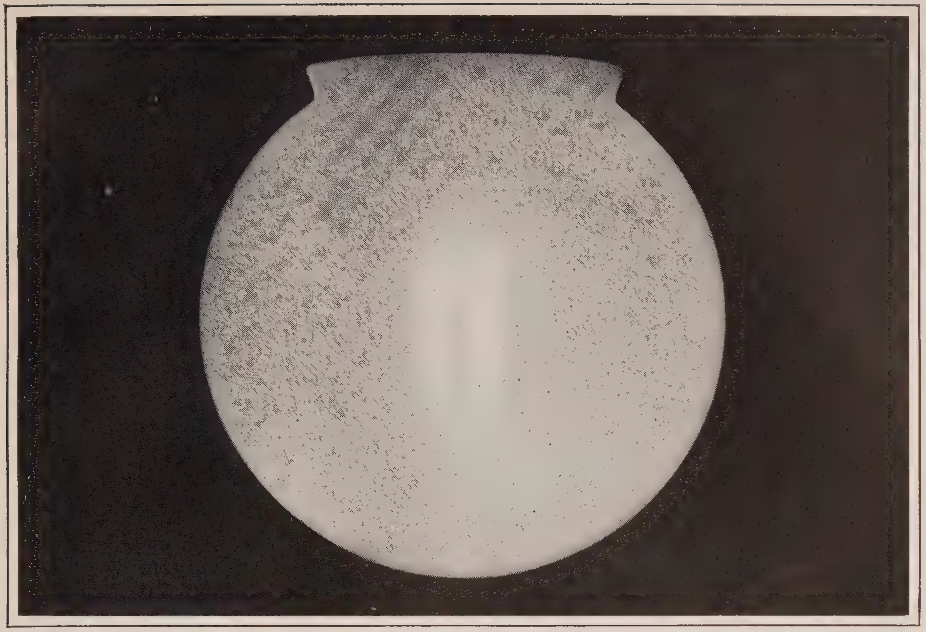
TOASTERS

American	Ideal
Automatic	National
Cadillac	Radiant
"Cory"	Simplex
Hot point	Universal
General Electric	Westinghouse

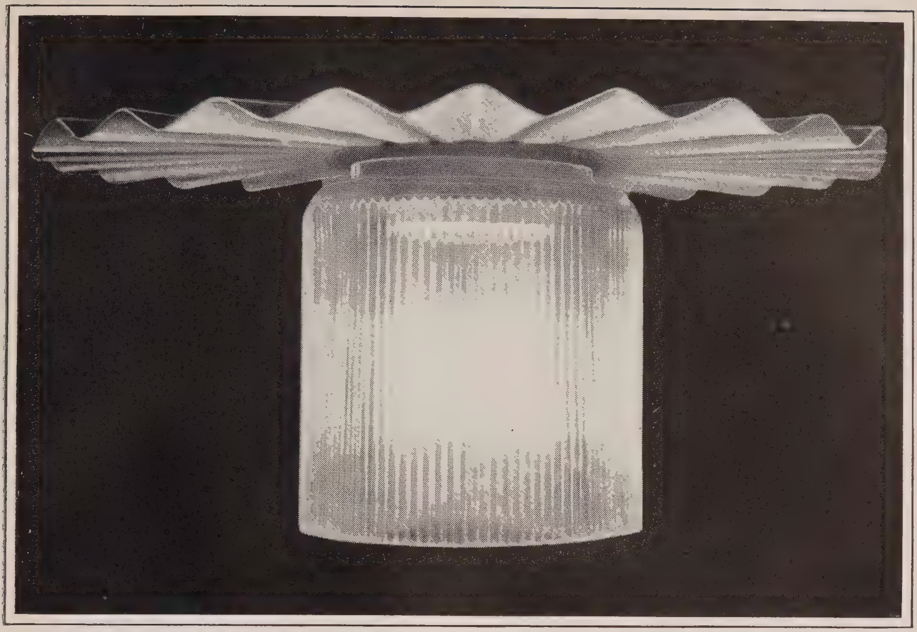
FLAT IRONS

American	Phelps
Chicago Flexible Shaft Co.	Progressive
"Fansteel"	Radiant
General Electric	Simplex
Hotpoint	Universal
Ideal	Vulcan
National	Westinghouse

In the past year, the oscillograph has often proved its usefulness in investigating phenomena which would have otherwise been impossible of examination. The wave forms of currents and potentials obtained from the high-tension testing transformers were made the subject of a series of oscillograms, the object being to


Globe Showing Poor Diffusion Characteristics—Illuminating Engineering Laboratory


Globe Showing Good Diffusion Characteristics—Illuminating Engineering Laboratory



Experimental Form of Asymmetrical Reflector—Illuminating Engineering Laboratory

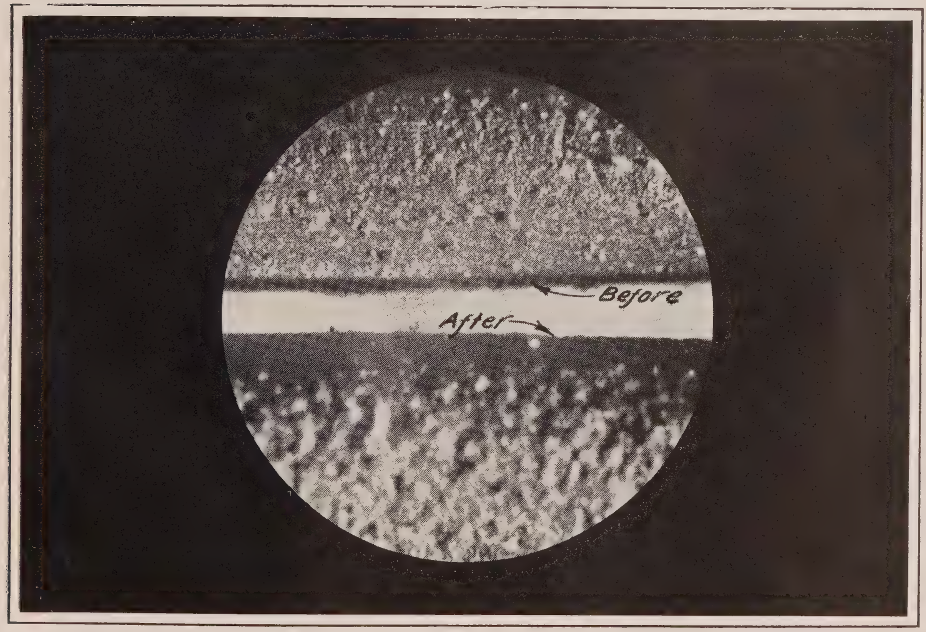


Photo-Micrograph of Sample of Heater Wire Before and After 100 Hours Service
(46 Diameters Magnification)

determine the behavior of the insulators tested, under the attack of a potential having a steep wave front as compared with its action when an approximately sinusoidal voltage is applied. This instrument has also proved invaluable in special investigations, among which may be mentioned—A series of tests to determine to what extent the triple frequency currents present with certain polyphase transformer connections, might be utilized for lighting and other purposes where a 25-cycle voltage is not desirable; the action of high potential fuses, and starting currents of incandescent lamps.

In connection with the installation of improved equipment on the Commission's telephone system, some interesting wave pictures were taken to show the efficiency of a repeating coil in transforming the currents which represent the sound vibrations of the human voice.

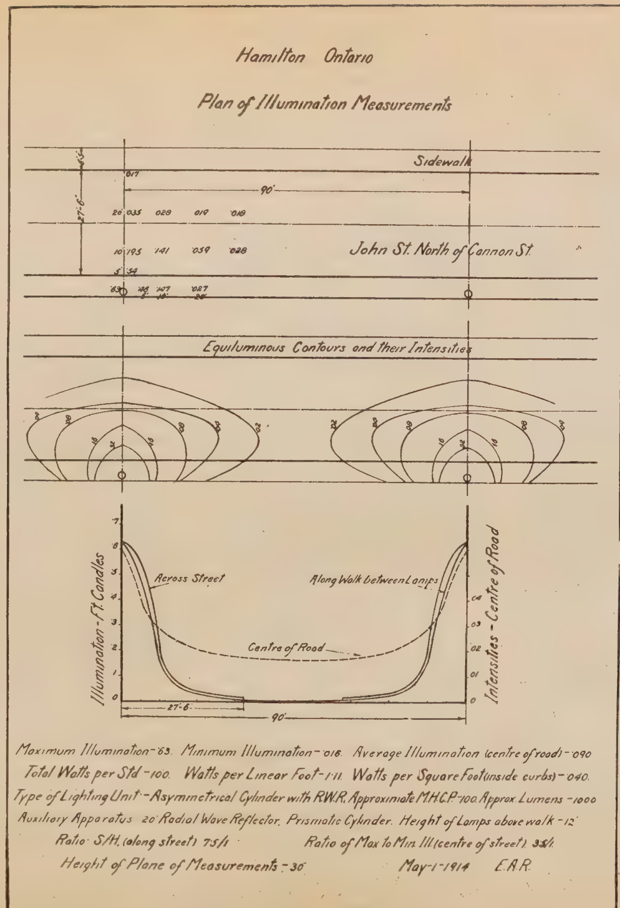
There has also been done under the direction of this department, much work in the repair, adjustment, design, and re-design of apparatus used by the Operating, Municipal, and Demonstration Departments. Under this head may be mentioned—portable load banks for meter inspectors and stationary load banks for municipalities, relay switches for remote control of street lights in scattered districts and a number of special attachments for portable and station meters.

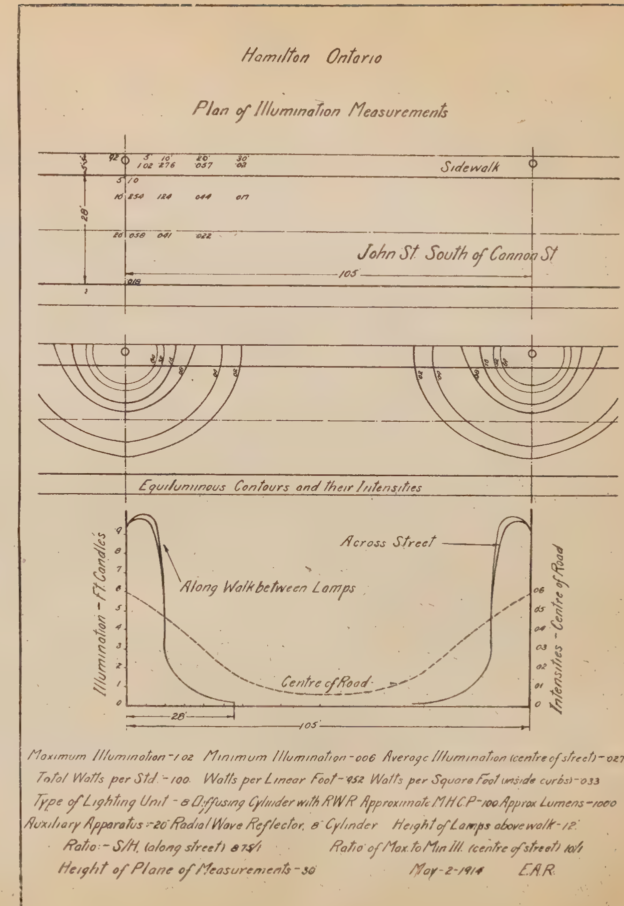
Illuminating Engineering Laboratory

Notable advancement has been made in recent years in this branch of engineering, with the result that universal interest has been aroused in lighting methods. Demands for better lighting have been most urgent where it is used as an advertising medium. Merchants have contributed generously to support this movement, and the results have been so gratifying that competition for the best illuminated streets has become so keen as to require considerable attention to be given to this comparatively new art. With the activity shown by merchants, the idea soon spread among the public, which resulted in better methods of street lighting being adopted. Speed of traffic has for safety demanded this course to be taken. Residential lighting is important, but does not receive the attention that other classes do; nor is it subject to the influences of selection and installation that are prevalent in larger projects.

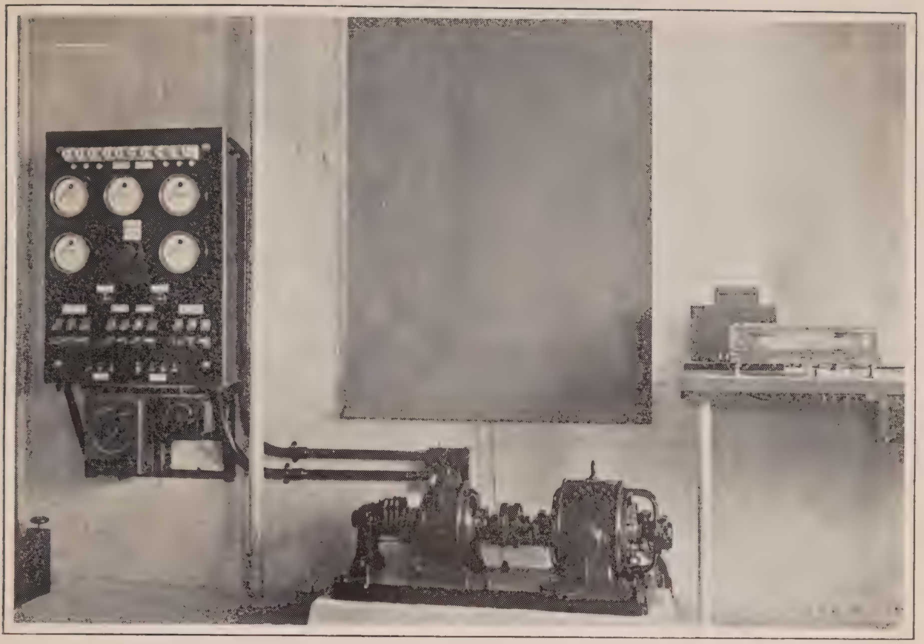
Street lighting with its varied problems has occupied the major portion of the attention of this department. Investigations with a portable photometer have enabled us to obtain data, the arrangement of which clearly indicates the improvements that could be made, and portrays the existing defects. Illumination diagrams have been made; exercise of considerable care in arranging the important data has been undertaken to facilitate comparison of similar systems. By judicious use of these diagrams, new installations may be erected to give better satisfaction than could otherwise be obtained. The type of installation depends primarily upon two factors; the density of traffic, and the economy necessitated by the character of the district.

Owing to these factors, several systems are employed. A large majority of towns use the series system of distribution, and use sixty to one hundred-watt lamps, equipped with radial wave reflectors. Most of the fixtures are mounted at a fair height, but the spacing depends on that of the power or telephone poles which preceded their erection. Five lamp clusters were very prominent a few years ago, due principally to their artistic appearance, and the difficulty of obtaining incandescent lamps of high intensities at satisfactory rates for the purpose. This type of fixture gave way to the magnetite and flame arcs, which were used to secure high intensities; but the advent of the nitrogen-filled tungsten lamp with its

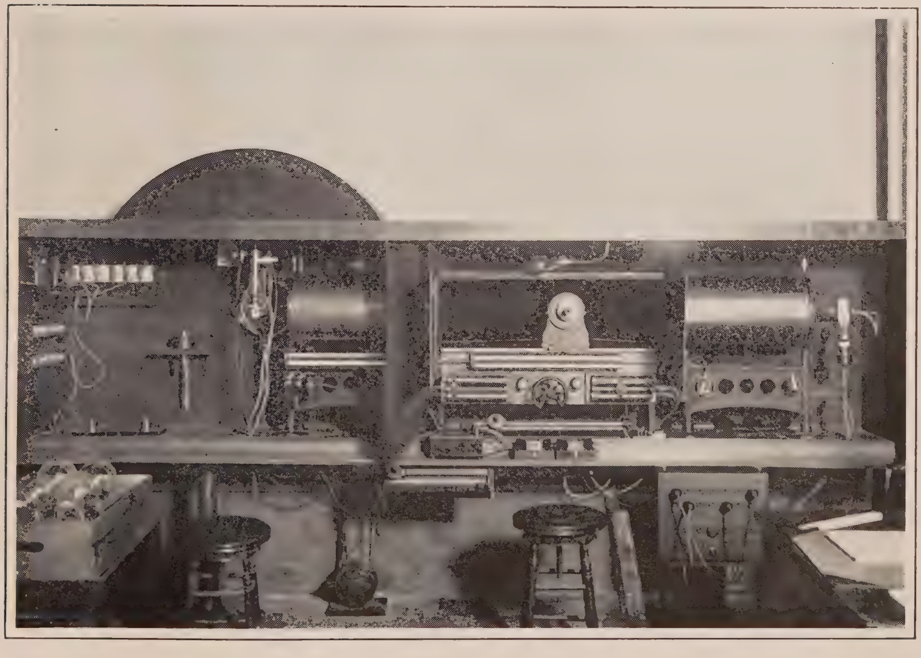




Comparative Illumination Diagrams showing Effect of Asymmetrical Reflector on Street Illumination—Illuminating Engineering Laboratory



Constant Potential A.C. Set and Kelvin Balance—Meter and Standards Laboratory



100-Inch Photometer—Lamp Testing Laboratory

numerous advantages, both from the standpoint of operation as well as maintenance, is likely to supplant it. This new lamp is destined to be an important factor in the future development of street lighting.

Out of the vast development now taking place in this field of exterior illumination, arises the need of a suitable line of dependable auxiliary devices, principal among which are reflectors, diffusers, and refractors. The high intrinsic brilliancy of the source requires some efficient reflector, combined with a suitable diffusing medium, and the large flux of light requires that means be provided for its proper distribution. To be assured that the complete unit satisfies the above conditions, photometric analysis should be insisted upon, otherwise the quality of the unit for the purpose for which it was designed is never known, and as a result its effectiveness is likewise a mystery.

A number of the problems suggested above have been thoroughly investigated, and, with the co-operation of municipal authorities and manufacturers, a great deal has been, and will be, accomplished, in obtaining the best results particularly in the branch of street lighting.

Assistance has been rendered several municipalities in securing data, the interpretation of which served to improve existing or tentative systems. New fixtures submitted as samples have been tested to determine their usefulness in the proper distribution of light. Nitrogen-filled tungsten lamps necessitated the design of new fixtures; the requirements and difficulties that would be encountered were presented to manufacturers, with the result that the suggestions hastened the appearance of satisfactory fixtures. The abolition of the five-lamp cluster brought out the problem of how to utilize the existing standard, and increase the height of the proposed unit. A design was submitted and the suggestions adopted. Many similar suggestions of less importance were given out, but the mention of these few serve to convey the idea of the service rendered, and scope of the work along this line.

An extensive series of tests was made on two types of diffusing glassware, to determine the quality with a variation of constituents as well as weight. The results showed a consistent superiority of one make over the other, hence we were able to recommend this class of glassware as satisfactory from numerous viewpoints. Other samples of shades, small glass reflectors, etc., were also photometrically tested.

The necessity of having proper means for investigating all forms of commercial illuminants, with and without their equipment, led to the design of a precision photometer, which will be sufficiently flexible in operation to be used for all classes of work to be performed at the laboratory. With an instrument of this character we will be in a position to carry on extensive photometric tests on illuminants, reflectors, and diffusing media. In addition to this information, problems arising in connection with photometry can be thoroughly investigated, to be later incorporated as methods employed in commercial work.

The general work of this department has been outlined, and a few of the problems investigated have been briefly described. The field open to be investigated is evident from the above suggestions, and with a complete line of apparatus necessary in conducting extensive tests, the work of this department is bound to manifest itself as an increasingly important section of the activities of the Commission.

Lamp Testing Laboratory

The expansion of the Commission is very forcibly indicated by the increase in volume of the work of this section. The number of lamps inspected (760 lots representing approximately 400,000 lamps) is a good criterion on which to judge of the growth in the business of the Commission among the various municipalities.

As explained in previous reports, a very close check is kept on the product supplied by the manufacturers, and the standard specifications are rigidly enforced. This ensures that only lamps of assured excellence are furnished to the municipalities.

The equipment of this laboratory includes—a 100-inch photometer with Bunsen and Lummer Brodhun Screens; a complete life test outfit, including regulating devices to keep current and voltage constant, by which the life performance of series and multiple lamps is investigated; besides other apparatus for conducting more scientific researches. Among the latter may be mentioned—a high power microscope which has furnished valuable information regarding the disintegration of the filaments of lamps during their life, and has also proved of value in connection with tests in other sections of the laboratory.

A complete set of standards is kept, and these are periodically checked against those of the leading standardizing laboratories in America.

A considerable part of the work at present under way consists in satisfying the demand for information regarding the characteristics of gas-filled lamps. Life tests on many of the types at present on the market have been made, and many more are under way. This information has been of value in many instances in protecting a prospective purchaser from an inferior product. No specifications dealing with gas-filled lamps have yet been issued, owing to the apparent impossibility of producing, in the present state of the art, gas-filled lamps of characteristics as uniform as those of the tungsten vacuum lamp.

One of the most important parts of the work of this section consists in examining lamps returned from the various municipalities, which have shown unsatisfactory performance. It is usually possible to determine in this way the cause of failure and thus to avoid misunderstanding between the purchaser and manufacturer.

Considerable research work has also been done in connection with the photometry of gas-filled lamps. This has taken the form of investigations of flicker photometers, and of ray filters and solutions. This part of the work, however, is given importance only in so far as it has a direct practical bearing on the problems encountered.

In short, the increase in the work of this section, and of the laboratories as a whole during the past year, is conclusive proof that the municipalities using Hydro power realize the advantages accruing to them from the possession by the Commission of a clearing-house for practical information.

SECTION V

HYDRAULIC INVESTIGATION AND CONSTRUCTION

MEASUREMENT OF STREAM FLOW

The systematic measurement of stream flow was begun in 1912 and has been carried on continuously up to the present time. While this work has been under way for a comparatively short period the results are extremely valuable in that they constitute the first attempt that has been made to ascertain with accuracy the flow characteristics of the important rivers of the Province. Records of this kind, extending over considerable periods of time, are absolutely indispensable in connection with working up schemes of hydraulic development, flood prevention and river improvement. These records are also exceedingly valuable in connection with the design and construction of bridges, and as a basis of study in connection with the classes of work above specified, they should ultimately be the means of saving the Province from the recurrence of the immense losses which have hitherto been occasioned through flood damage and the improper design of dams and bridges. Work of this kind being essentially of a preventative nature, must of necessity be carried out through a Governmental agency, and in the matter of hydraulic development it is also evident that no private enterprise can afford to wait four or five years to collect sufficient records of stream flow for a proper study of any specific scheme under consideration.

The necessity for obtaining accurate stream flow records may be illustrated by the case of the Maitland River. At the request of the County Council of the County of Huron, the Commission in 1912 reported on the possibility of developing power at the Black Hole on the Maitland River for the purpose of supplying power to the County of Huron. The circumstances were such that it was necessary to make this report at the earliest possible date, and the only dependable records of stream flow available were those taken by the Commission between May, 1911, and May, 1912. On the strength of these records, it was stated that the probable minimum continuous capacity of the site was 800 h.p. The records for the summer of 1912 showed a minimum capacity in excess of 800 h.p., but the records for 1913 showed the minimum capacity of 700 h.p., and for 1914 a minimum capacity of 550 h.p. It was therefore necessary to obtain records extending over a period of four years before it could be proved that the Black Hole site was useless as a source of continuous power. Furthermore, if the construction of the plant had been proceeded with on the basis of the 1911 records, a disastrous failure would have resulted. The same danger exists at the present time on practically every river in the Province.

The scope of the stream measurement work has been gradually extended, until at the present time all the principal rivers in the south-western peninsula of the Province are under observation, as are also the rivers flowing into Georgian Bay and Lake Huron.

Permanent metering stations have also been established on the principal rivers in the Cobalt and Porcupine mining districts and westward along the line of the Transcontinental. The English and Winnipeg Rivers and their tributaries, and the rivers tributary to Rainy Lake, have been under observation for the past year and a considerable amount of valuable data obtained, although the difficulty of

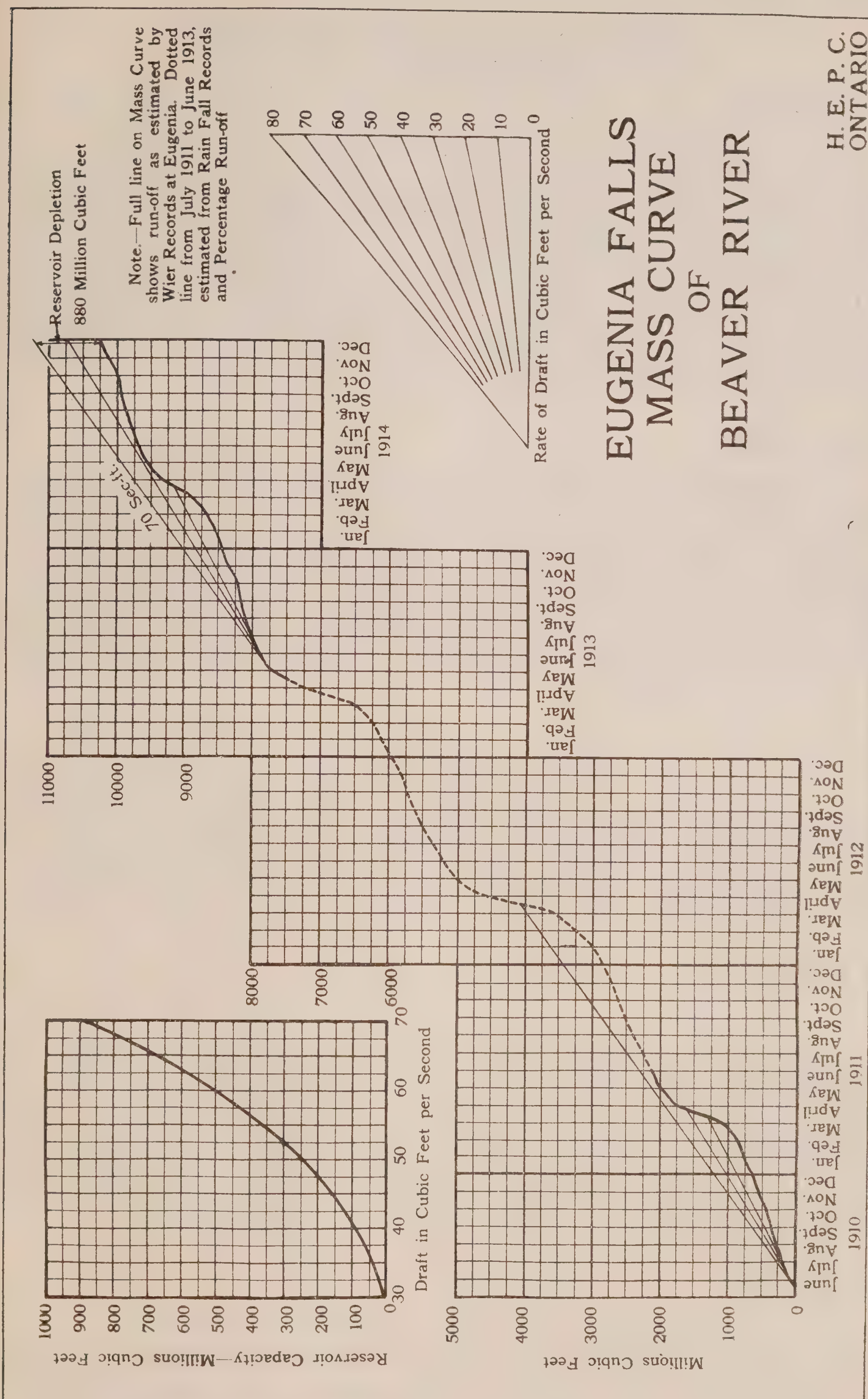
obtaining gauge recorders in the unsettled districts and the long distances to be covered by the field men, has made the collection of data a much slower process in this territory than in the case of the other districts above mentioned.

Enamelled steel staff gauges have been set at all stations where good rating curves have been secured and where it was possible to obtain a gauge reader. Wherever possible, these gauges are read twice a day and the records sent to the Toronto office at the end of each week. At many of the stations it has been found impossible to eliminate the effects of back water, and wherever possible these stations have been abandoned and more favorable ones chosen. While this source of error has by this means been largely eliminated in the case of the stations on the northern rivers, it has been found impossible to altogether eliminate it in the case of several rivers in the south-western peninsula, principally on account of the large number of mill dams located upon the same.

Tabulated results of the stream measurement work up to December 31st, 1914, are appended hereto. All discharge measurements were made with standard meters, and except where otherwise noted are accurate within a limit of five per cent. The rating curves from which the discharge tables were compiled are, in most cases, well defined, but in the case of certain streams, as noted in the tables, some revision of the tabled discharges may be necessary when further data on winter discharge has been obtained and extra points fixed in the middle range of some of the rating curves.

The most important hydrometric studies carried on during the past year were those on the Grand and Beaver Rivers. Work on the Grand River has been laid out in considerable detail and fifteen metering stations located throughout the watershed. Considerable data has been obtained which will aid in fixing the minimum flow of the main river and tributaries, but owing to the unusually light freshet which occurred in the spring of 1914, no data is yet available in connection with extreme high water conditions similar to those which have obtained in former years. Until this data has been obtained as a result of the actual measurement of the higher ranges of flood discharge, the hydrometric investigations on the Grand River cannot be used as a basis for the study of a flood prevention scheme.

The hydrometric study of the Beaver River has been carried on continuously during the past year and a considerable amount of essential information has been obtained bearing upon the economics of the power development at Eugenia Falls, which is now in course of construction. The maximum discharge at Eugenia Falls as determined to date is about 550 cubic feet per second, or about 7 cubic feet per second per square mile of watershed. The minimum measured flow is 20 cubic feet per second, which means a run-off of .27 cubic feet per second per square mile of watershed. Weir discharge records from May, 1910, to June, 1911, and from May, 1913, to date, together with an estimate of the run-off during the intervening period, based on weir and precipitation records, indicate that the average flow from the watershed above Eugenia Falls is about 71 cubic feet per second. Also, an analysis of the appended mass curve covering the same period, indicates that this average flow may be impounded for useful work with a storage capacity of 900 million cubic feet. The precipitation records for the period above mentioned appear to be fairly representative, as the year 1910-11 was dry, the year 1913-14 the driest on record, and the year 1912 was very wet. It would seem, therefore, that the average run-off for the whole period is derived from a fairly representative cycle of maximum and minimum flow conditions.


EUGENIA FALLS
MASS CURVE
OF
BEAVER RIVER
H. E. P. C.
ONTARIO
Reservoir Depletion
880 Million Cubic Feet
Note.—Full line on Mass Curve shows run-off as estimated by Wier Records at Eugenia. Dotted line from July 1911 to June 1913, estimated from Rain Fall Records and Percentage Run-off
Rate of Draft in Cubic Feet per Second
Millions Cubic Feet
Reservoir Capacity—Millions Cubic Feet
Draft in Cubic Feet per Second
70 Sec.ft.
1910
1911
1912
1913
1914

POWER AND STORAGE SURVEYS

Grand River

Surveys of possible storage basins on the Grand River were carried on during the winter and most of the summer of 1914. Accurate contour surveys were made of two projected storage locations on the main river, one near Blair and one below Elora, also a location on the Conestogo River and one on the Nith River near Canning. These surveys have been plotted and the information as to storage capacity which it will be possible to obtain from them, together with the stream flow data which is being collected from the fifteen stations in the Grand River watershed, will serve to indicate whether or not the projected flood prevention scheme on the Grand River is physically feasible.

Northern Ontario

During the summer of 1914 a field party was kept continuously employed in making surveys of possible power sites on the rivers flowing north across the line of the Transcontinental Railway into James Bay. Eight power sites in all were surveyed on the Abitibi, Blanche, Groundhog, Frederickhouse, Kapuskasing and Mettagami Rivers. These surveys, together with the stream flow measurements taken in that territory, will be of great assistance in working out schemes to supply the rapidly growing power market, and in supplying information which may lead to the establishment of industrial enterprises.

Cobden

In accordance with a resolution forwarded by the Council of the Village of Cobden, a survey was made during December, 1914, of a power site in the vicinity of the village with a view to ascertaining whether or not it could be economically utilized as a source of power for the municipal and industrial requirements of the village. A report based on the results of this survey is now in course of preparation.

Saugeen River

A survey is now being made near the mouth of the Saugeen River with a view to ascertaining whether sufficient head can be economically created to justify the development of power at this point as an adjunct to the water power now being developed by the Commission at Eugenia Falls. The high head and large storage capacity at Eugenia Falls afford unusually favorable facilities for peak load operation, and if it can be shown that the lower stages of flow on the Saugeen River can be developed within reasonable limits of cost, the two plants can be operated together in such a way as to very largely increase their effective capacity.

Eugenia Falls

Before actual construction work was proceeded with in connection with the Eugenia Falls development, it was necessary to make detailed topographical surveys of the reservoir basin, the sites for dams, and various possible locations for the canal, head works, pipe lines and power house. The results of the survey of the reservoir site are summarized in the table below:

Eugenia Storage Basin—Summary of Capacities

Contour	Volume between Contours	Total Volume	Area in Acres
610			
615	750,000 cu. ft.	750,000 cu. ft.	6.9 acres
620	3,210,000 cu. ft.	3,960,000 cu. ft.	22.9 "
625	8,032,500 cu. ft.	11,992,500 cu. ft.	51.1 "
630	15,660,000 cu. ft.	27,652,500 cu. ft.	92.8 "
635	41,612,500 cu. ft.	69,265,000 cu. ft.	291.0 "
640	161,600,000 cu. ft.	230,765,000 cu. ft.	1,194.0 "
645	284,250,000 cu. ft.	515,015,000 cu. ft.	1,420.0 "
650	336,875,000 cu. ft.	851,890,000 cu. ft.	1,675.0 "

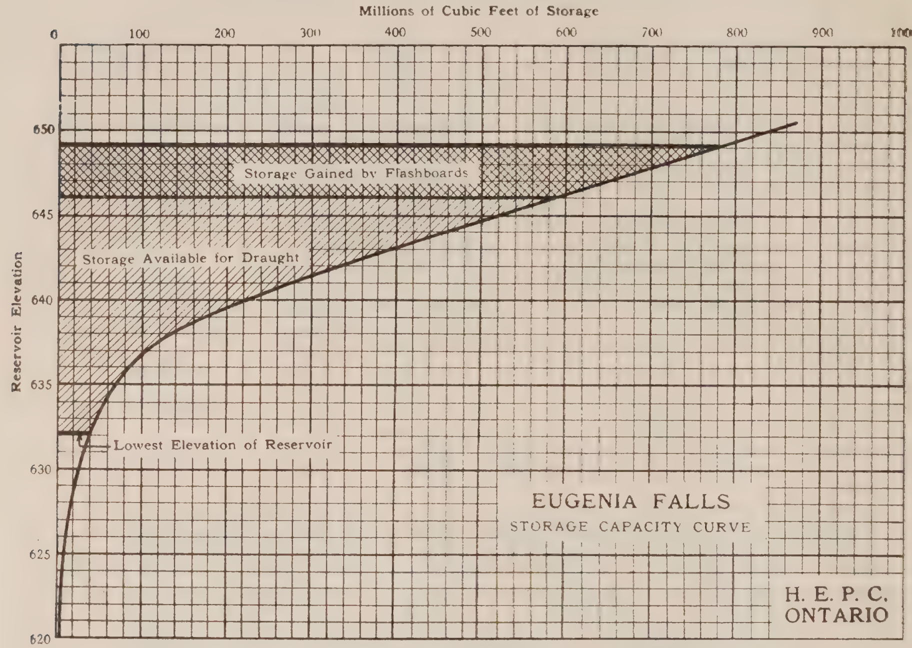
The appended Storage Capacity Curve shows the impounding capacity of the main reservoir for different contour elevations. As indicated on this curve, the gross capacity with 3 feet of flash boards is about 780 million cubic feet, of which 190 million cubic feet is secured by the use of the flash boards. About 40 million cubic feet of this total capacity is not effective, as it is below the minimum limit of reservoir draft.

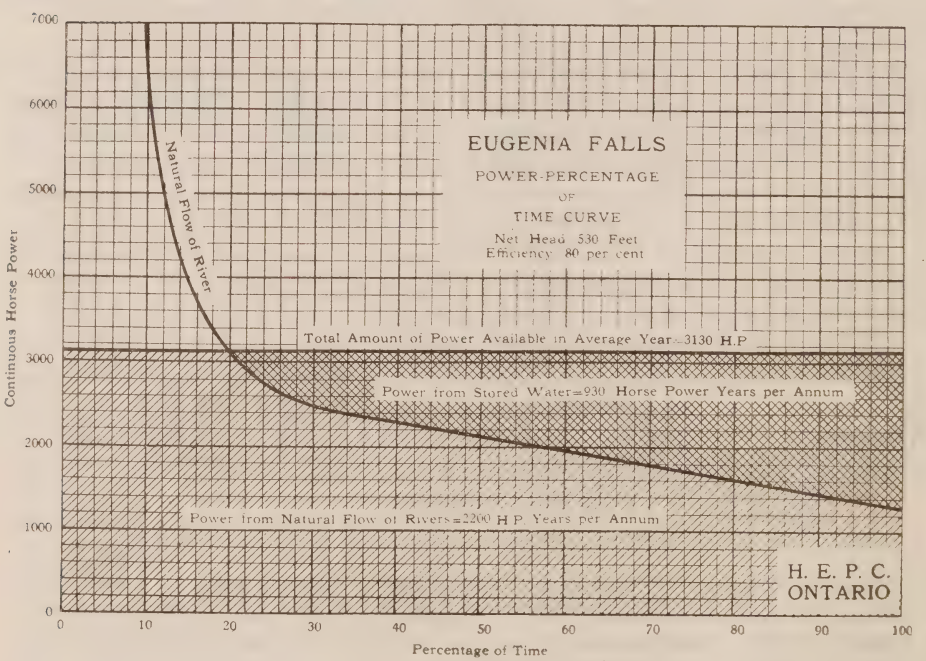
The above volume of storage capacity is obtainable at the head works of the plant as indicated in the appended illustration showing the general layout of the development.

To show clearly the benefit derived from the creation of this storage, the appended Power-Percentage of Time Curve has been plotted. The curve indicates that the minimum continuous capacity of the Eugenia Falls site is about 1,200 h.p., while under the conditions existing as a result of the present scheme of development, the continuous capacity available will be about 3,130 h.p., a capacity which, under natural conditions, would only be available for 73 days in each year. This curve shows that an additional 50 per cent. of power is derived from the impounded water, while the continuous capacity of the stream is increased to nearly three times its natural minimum capacity.

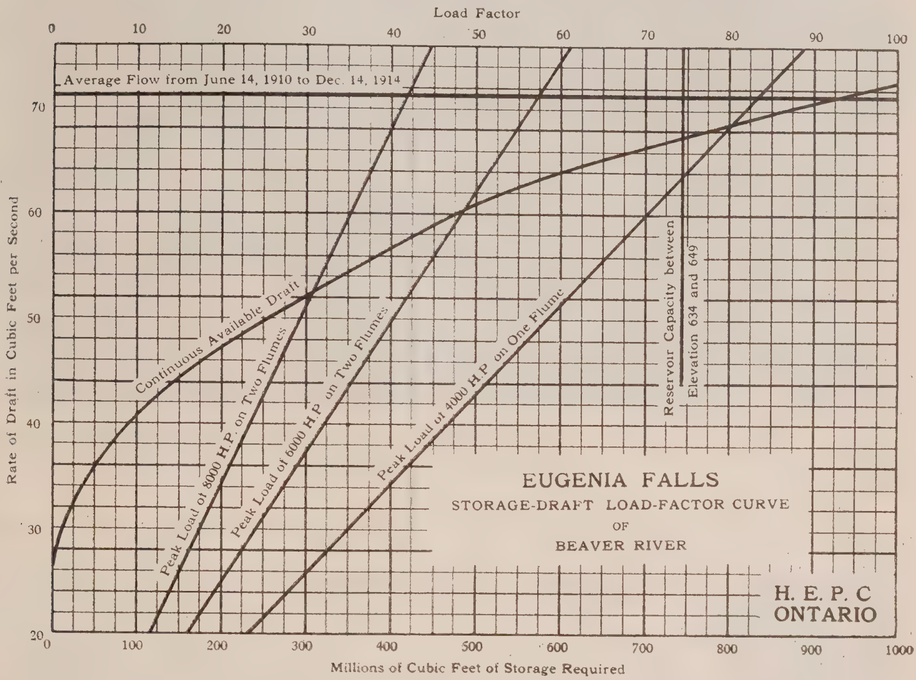
The appended Storage-Power Curve indicates that with a reasonable deduction for evaporation and seepage, a commercial load of 6,000 e.h.p. can be carried with an annual load factor of 53 per cent., or a commercial load of 8,000 e.h.p., with an annual load factor of 38 per cent. It also indicates that sufficient capacity has been provided in the present storage reservoir to equalize the flow of the river for all ordinary years.

When the full capacity of the plant has been reached, operating conditions may indicate the desirability of providing additional storage as insurance against the possibility of three abnormally dry years coming in succession. In such event the additional storage necessary can be obtained a few miles up the river near the Village of Feversham, where 300 million cubic feet of storage can be secured at reasonable expense. The creation of this additional storage would provide sufficient protection against any scarcity of water arising from an abnormally protracted period of light precipitation. Whether it will ever be necessary or desir-


Millions of Cubic Feet of Storage
0
100
200
300
400
500
600
700
800
900
1000
650
645
640
635
630
625
620
Reservoir Elevation
Storage Gained by Flashboards
Storage Available for Draught
Lowest Elevation of Reservoir
EUGENIA FALLS
STORAGE CAPACITY CURVE
H. E. P. C.
ONTARIO


7000
6000
5000
4000
3000
2000
1000
0
Continuous Horse Power
Natural Flow of River
EUGENIA FALLS
POWER-PERCENTAGE
OF
TIME CURVE
Net Head 530 Feet
Efficiency 80 per cent
Total Amount of Power Available in Average Year=3130 H.P
Power from Stored Water=930 Horse Power Years per Annum
Power from Natural Flow of Rivers=2200 H.P. Years per Annum
H. E. P. C.
ONTARIO
0
10
20
30
40
50
60
70
80
90
100
Percentage of Time

able to provide storage at Feversham cannot now be stated with certainty, the more so by reason of the fact that the Eugenia plant may ultimately be operated in parallel with developments on other rivers in the district. On this account, it is more than likely that no condition will arise necessitating additional storage at Eugenia.



POWER CONSTRUCTION

Wasdell's Falls

In the Annual Report for 1913 the conditions which led to the inauguration of the Commission's policy of hydraulic development were discussed and the preliminary operations in connection with the construction of the Wasdell's Falls plant on the Severn River were also fully covered. This plant was finally completed in September, 1914, and was formally opened on the 5th of October. Since that time it has been operating continuously, and supplying power to various municipalities on the east shore of Lake Simcoe as far south as Cannington.

The Wasdell's Falls installation is essentially of the low head type, and is the direct opposite in every detail of the type of plant now being installed at Eugenia Falls. The illustrations published in the 1913 report, and those shown here, indicate the structural details and general appearance of the finished plant. The whole of the power-house substructure, including inlet piers, bulk-heads, wheel-chambers and draft-tubes, is of mass concrete construction. The superstructure consists of a reinforced concrete frame work and roof with reinforced plastered walls. All outside walls consist of two thicknesses of plaster supported on "Hyrib" reinforcement with an intervening 4in. air space. The inner walls consist of a single thickness of similar construction. The crane girders are also of reinforced concrete, as will be seen in the accompanying illustration of the power-house interior.

The hydraulic equipment consists of two main turbines and an exciter turbine installed by the Boving Co. of Lindsay, Ont. The main turbines are of the vertical double-runner, open-flume type, operating at 90 r.p.m., and have a guaranteed capacity of 600 h.p. and 85 per cent. efficiency at three-quarter gate under a normal head of 12 ft. The exciter turbine is of the single runner, vertical open-flume type, operating at 190 r.p.m. and having a full gate capacity of 55 h.p.

The main turbines are direct connected through flexible couplings to 400-kv-a., 60-cycle, three-phase, 2,200-volt generators installed by the Swedish General Electric Co., and the exciter turbine is similarly direct connected to a 20-k.w., 125-volt, direct-current exciter generator supplied and installed by the same company.

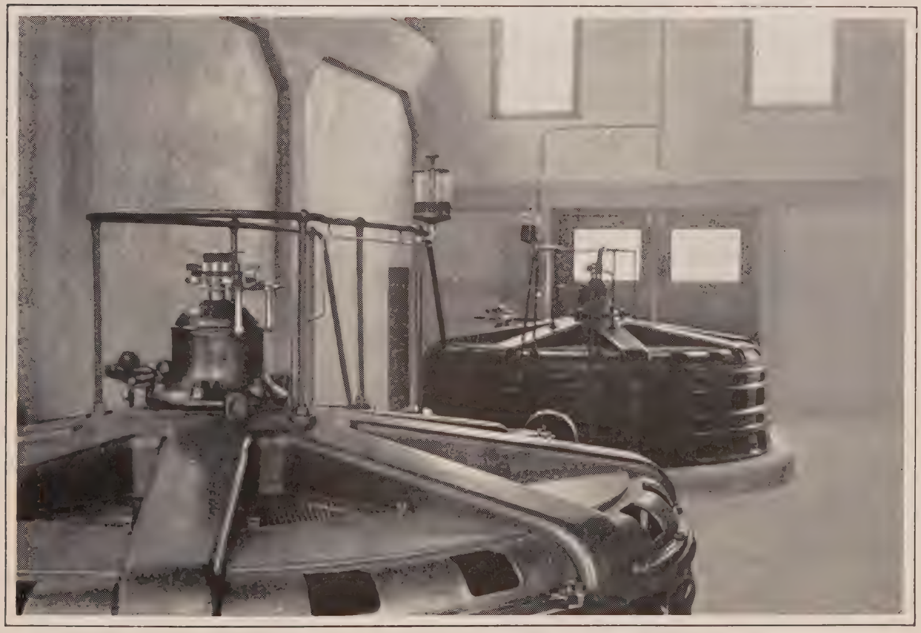
Eugenia Falls

The general layout of the Eugenia Falls power development is clearly shown in the accompanying illustrations, and consists essentially of a storage basin about 1,650 acres in area created by two dams. No. 1 Dam, located in the main channel of the stream, is of reinforced concrete construction, and No. 2 Dam, which closes a low contour in the side of the storage basin, is of earth fill construction with a clay puddle core and rip-rapped faces. The canal leading from the main storage basin is designed to carry the maximum volume of water required for a peak capacity of 8,000 h.p. at minimum draft level. The gate house consists of reinforced concrete wing walls with mass concrete inlet piers having reinforced concrete curtain walls between them. In each of the two inlet openings is placed a 66-in. butterfly valve provided with a combined motor operated and hand operated mechanism. The water leaves the gate house through two 46-in. wood stave pipes 3,350 ft. long operating under a maximum head of about 100 ft. The wood stave pipes are connected at the head block to two 52-in. rivetted steel penstocks 1,557 ft. long operating under an average static head of 530 ft. A

Wasdell's Falls—Showing Dam and Power-House under Construction, with "Hyrib" Wall Reinforcement in Place

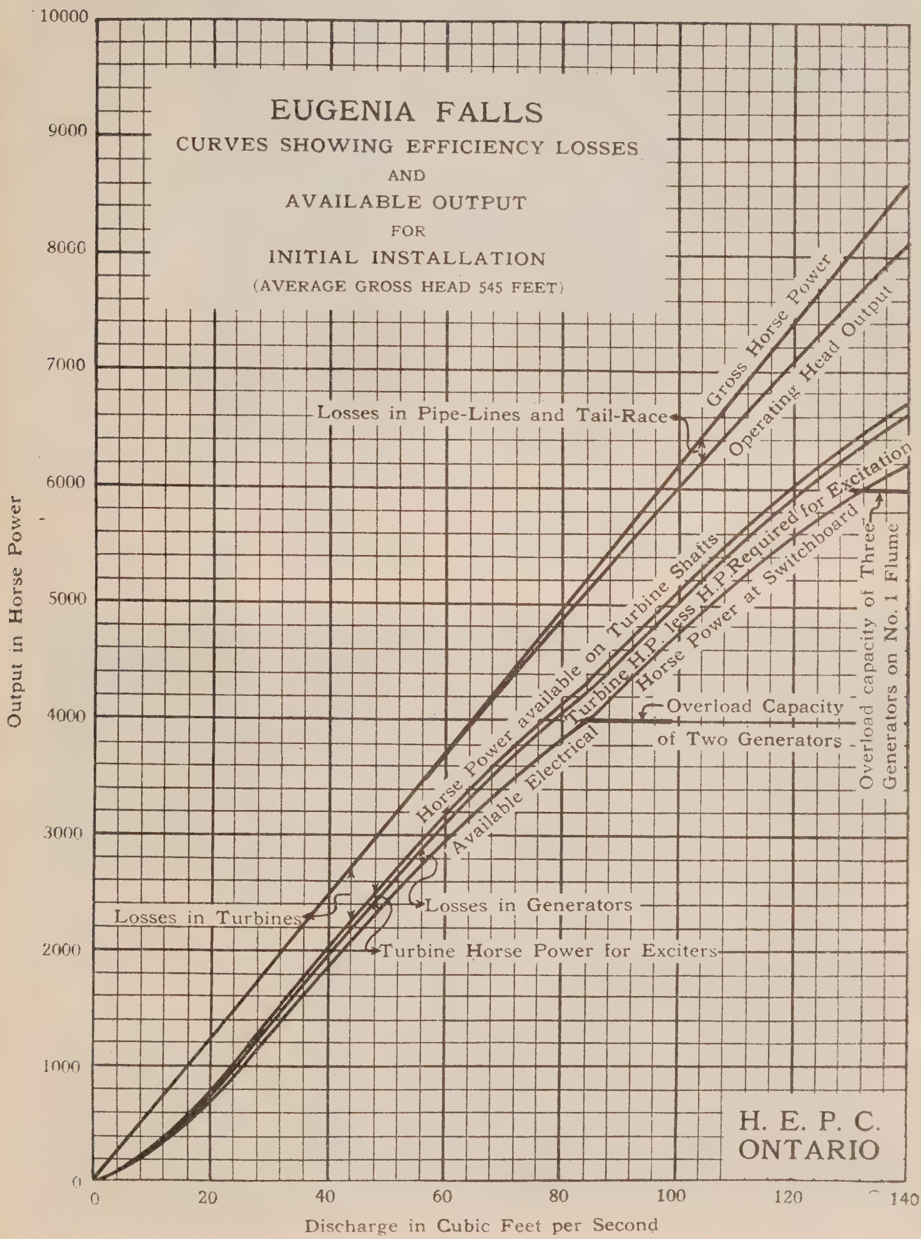
Wasdell's Falls—Dam and Forebay Side of Completed Power-House

Wasdell's Falls—Showing End of Enclosed Forebay, Front of Machine Room, and Transformer and Switch-Room Annex



Wasdell's Falls—Interior of Finished Power-House

cross-over connection to be controlled by a 36-in. valve is provided at the power-house end. The present installation consists of one wood pipe and one penstock, this being sufficient for the handling of the preliminary installed capacity of 4,000 e.h.p. At the junction of the wood stave pipe and the steel penstock, a differential



surge tank is provided, and at the power-house end of the penstock is located a 50-in. butterfly valve operated by an hydraulic impulse motor.

In the power-house sub-structure is to be installed a cast steel distributor pipe with connections for two 2,250 h.p. turbines. These turbines are of the reaction

type with spiral wheel-cases and overhung runners. They will operate at 900 revolutions per minute, and are equipped with 6,000-lb. fly-wheels and automatic by-pass relief valves direct connected to the governor.

The Order-in-Council authorizing the Commission to proceed with the development of power at Eugenia Falls for the supply of the Owen Sound district was issued under date of Nov. 6th, 1913.

Pursuant to this Order, plans and specifications covering the complete development were prepared, and tenders for the dams, canal and flume line excavation and head works were called for in May, 1914. A large number of tenders for this portion of the work were received, and after careful consideration of the same, the contract for No. 1 Dam was awarded to the Ambursen Hydraulic Construction Co. of Montreal, and the contract for No. 2 Dam, the canal, flume line excavation and head works was awarded to the Hyland Construction Co. of Toronto.

Under the terms of these contracts, Dam No. 1 was to be completed up to elevation 635 by December 25th, 1914, and No. 2 Dam, the head works, flume line excavation, and aproximately half of the canal excavation was to be completed by December 15th, 1914. Both contractors displayed great energy in starting and carrying on the work, with the result that the Hyland Construction Co. finished all the work required of them within the time limit, and the Ambursen Hydraulic Construction Co. not only fully met their contract obligations, but had so far completed the entire work on the contract that they were able to dismantle and partially remove their construction plant before Christmas

The contract for the wood stave pipe was awarded to the Pacific Coast Pipe Co. of Vancouver, B.C. The installation of this pipe is now under way and will shortly be completed.

The contract for the surge tank was awarded to the Canadian Allis-Chalmers Co. of Toronto, and while the material is fabricated in their shops, they have as yet made no start on the erection work at Eugenia.

The contract for the steel penstock was awarded to the Thor Iron Works, Toronto. All the material for this penstock has been fabricated and delivered, and the erection of the same is now well under way.

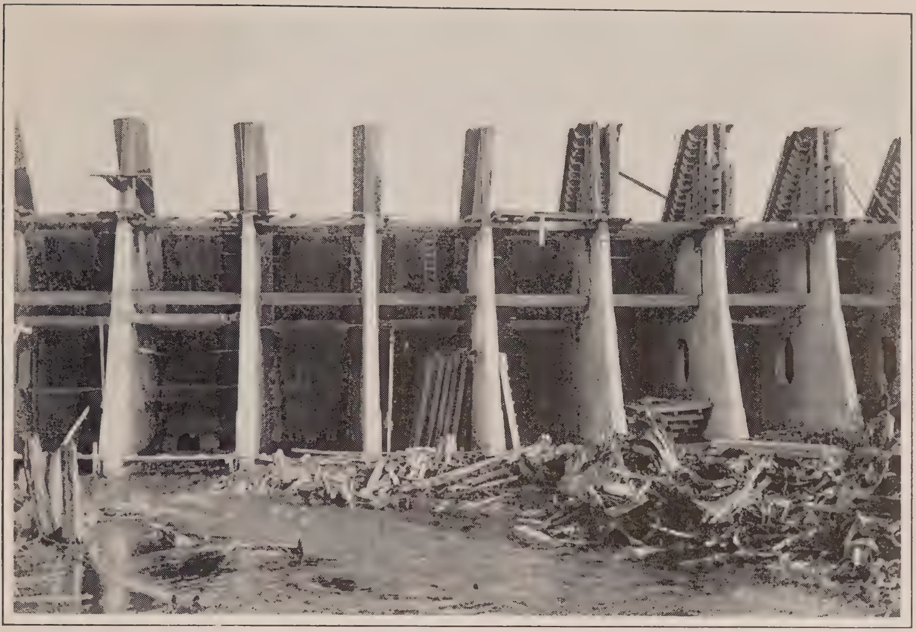
The contract for the turbines was awarded to the Escher Wyss Co. of Zurich, Switzerland. A portion of the machinery has already been shipped from Zurich, and the balance of the order is to be shipped by the end of February, 1915.

The 66-in. butterfly valves at the head-gates were constructed by the Boving Co. of Lindsay, Ontario, and have been installed. The 50-in. butterfly valve at the power-house is being built by the Canadian Allis-Chalmers Co., and is now in the shops ready for shipment.

A diagram is appended hereto showing in concise form the various hydraulic losses in the installation, and the gross and net output in horse power for various discharges and combinations of units.

Eugenia Falls—Showing Portion of Cut-Off Trench in No. 1 Dam, Cleaned Off Ready for Placing Concrete

Eugenia Falls—Showing Power-House Location and Penstock Line



Eugenia Falls—Showing Buttresses of No. 1 Dam in Course of Construction

Eugenia Falls—Showing Line of Partially Completed Buttresses

Eugenia Falls—North Half of No. 1 Dam

Eugenia Falls—South Half of No. 1 Dam

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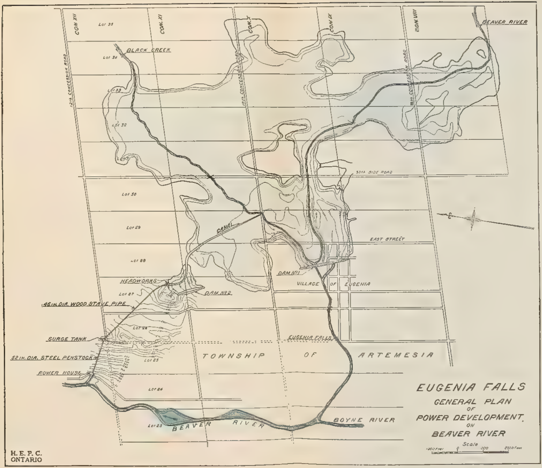
Eugenia Falls—No. 2 Dam in Early Stages of Construction

Eugenia Falls—Up-Stream Face of No. 2 Dam, Showing Unfinished Rip-Rap

Eugenia Falls—Lower End of Canal, and Gate-House Substructure

Eugenia Falls—Wood-Stave Pipe-Line Carried Across a Depression. Trestle Built of Cedar Cut from the Reservoir Basin


BEAVER RIVER
BLACK CREEK
CANAL
HEADWORKS
DAM Nº2
DAM Nº1
46 IN. DIA. WOOD STAVE PIPE
SURGE TANK
52 IN. DIA. STEEL PENSTOCK
POWER HOUSE
VILLAGE OF EUGENIA
EUGENIA FALLS
EAST STREET
TOWNSHIP OF ARTEMESIA
BOYNE RIVER
CON. XII
CON. XI
CON. X
CON. IX
CON. VIII
12TH CONCESSION ROAD
10TH CONCESSION ROAD
8TH CONCESSION ROAD
30TH SIDE ROAD
Lot 35
Lot 34
Lot 33
Lot 32
Lot 30
Lot 29
Lot 28
Lot 27
Lot 26
Lot 25
Lot 24
Lot 23
EUGENIA FALLS
GENERAL PLAN
OF
POWER DEVELOPMENT,
ON
BEAVER RIVER
Scale
H. E. P. C.
ONTARIO

STREAM FLOW DATA

Regular Stations

River	Location	Drainage Area Sq. Miles	Township	County or District
Beaver	at Eugenia	74	Artemesia	Grey
"	at Feversham	37	Osprey	"
"	near Kimberley	105	Euphrasia	"
Black	near Washago	598	Mara	Ontario
Blanche	near Englehart	230	Evanturel	Timiskaming Dist.
Credit	at Cataract Jct	91	Caledon	Peel
Eagle	at Eagle River	933	Aubrey	Kenora Dist.
English	at Caribou Falls			"
"	at Ear Falls			"
"	at Manitou Falls			"
"	near Oak Lake Falls			"
"	at Sturgeon Falls			"
Footprint	at Rainy Lake Falls	588	Indian Reserve, 17a	Rainy River Dist.
Frederickhouse	at Frederickhouse	1,252	Clute	Timiskaming Dist.
Maganatawan	near Katrine	151	Armour	Parry Sound Dist.
"	at Knoeffler's Falls		Chapman	" "
Maitland	at Ben Miller	950	Colborne	Huron
Manitou	at Devil's Cascades	440		Rainy River Dist.
Mississagi	at Mississagi	3,522	Cobden	Algoma Dist.
Montreal	at Latchford		Coleman	Timiskaming Dist.
Muskoka	at Tretheway's Falls	658	Draper	Muskoka Dist.
Nottawasaga	near Nicolston	325	Essa	Simcoe
Saugeen	near Port Elgin	1,565	Saugeen	Bruce
"	near Walkerton	895	Brant	Bruce
Seguin	near Parry Sound	363	McDougal	Parry Sound Dist.
Seine	at Skunk Rapids	3,483	near Bennett	Rainy River Dist.
Severn	at Severn Bridge	2,075	Morrison	Muskoka Dist.
South	near Powassan	322	Himsworth	Parry Sound Dist.
Spanish	at Espanola	6,949	Merrit	Sudbury Dist.
Sturgeon	near Smoky Falls	2,135	Springer	Nipissing Dist.
Teeswater	at Paisley	227	Elderslie	Bruce
Thames, Main stream	near Byron	1,270	Westminster	Middlesex
" North branch	at London, Richmond St	615	London	"
" South branch	" Adelaide St.	515	London	"
Turtle	at Mountain Rapids	1,841	near Indian Res., 26c	Rainy River Dist.
Vermilion	near White Fish	1,900	Graham	Sudbury Dist.
Wabigoon	near Quibell	1,612	Wabigoon	Kenora Dist.
"	at Wabigoon Falls	1,026		"
Wahnapitae	near Wahnapitae	910	Dryden	Sudbury Dist.

Daily Gauge Height and Discharge of Thames River (Main Stream) near Byron for 1914

Drainage Area 1,270 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1									7.65	2100	6.75	830
2										1698	6.75	830
3									7.08	1295	6.67	730
4									7.00	1180	6.67	730
5									8.42	3210	6.75	830
6									10.00	6200	7.00	1180
7									9.42	5075	6.83	940
8									8.58	3575	6.83	940
9									8.08	2750	7.00	1180
10									7.42	1775	6.92	1065
11									7.25	1335	6.83	940
12									7.17	1420	6.67	730
13					7.82	2350			7.83	2360	6.58	630
14					8.02	2740			7.67	2120	6.58	630
15					9.40	5037			7.42	1775	6.50	555
16					11.57	9260			7.17	1420	6.50	555
17					11.40	8930			7.00	1180	6.50	555
18					10.40	8930			6.83	940	6.42	490
19					8.90	4125			6.75	830	6.50	555
20					7.90	2468			6.75	830	6.50	555
21					7.74	2230			6.67	730	6.50	555
22					7.67	2120			6.75	830	6.50	555
23					7.40	1745			6.75	830	6.50	555
24					7.32	1630			6.75	830	6.50	555
25					7.57	1985			6.67	730	6.58	630
26					9.40	5037	8.90	4125	6.92	1065	6.50	555
27					9.74	5695	8.49	3420	7.00	1180	6.58	630
28					13.40	12830	7.82	2350	7.00	1180	6.58	630
29							7.74	2230	6.92	1065	6.58	630
30							7.63	2070	6.83	940	6.58	630
31									6.83	940		

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	6.50	555	6.08	275	6.67	730	6.33	420	6.42	490	7.67	2120
2	6.58	630	6.08	275	7.92	2500	6.33	420	6.42	490	8.08	2750
3	6.58	630	6.17	320	7.33	1645	6.33	420	6.42	490	7.75	2250
4	6.50	555	6.17	320	6.92	1065	6.25	365	6.42	490	7.33	1660
5	6.33	420	6.17	320	6.75	830	6.25	365	6.42	490	7.25	1550
6	6.50	555	6.17	320	6.75	830	6.25	365	6.42	490	7.00	1180
7	6.50	555	6.25	365	6.58	630	6.17	320	6.42	490	7.92	2500
8	6.42	490	6.17	320	6.58	630	6.25	365	6.42	490	7.75	2250
9	6.42	490	6.08	275	6.50	555	6.25	365	6.33	420	7.92	2500
10	6.42	490	6.25	365	6.50	555	6.33	420	6.33	420	7.67	2120
11	6.42	490	6.17	320	6.42	490	6.25	365	6.33	420	7.58	2010
12	6.42	490	6.33	420	6.42	490	6.25	365	6.33	420	7.50	1900
13	6.50	555	6.08	275	6.42	490	6.33	420	6.42	490	6.58	630
14	6.50	555	6.08	275	6.33	420	6.42	490	6.50	555	6.00	250
15	6.50	555	6.08	275	6.33	420	6.42	490	6.67	730	6.00	250
16	6.50	555	6.25	365	6.33	420	6.42	490	6.92	1065	6.75	830
17	6.50	555	6.33	420	6.33	420	6.42	490	7.50	1900	6.83	940
18	6.42	490	6.25	365	6.33	420	6.42	490	7.17	1420	6.00	250
19	6.25	365	6.50	555	6.33	420	6.33	420	7.08	1295	6.00	250
20	6.42	490	6.75	830	6.33	420	6.33	420	6.83	940	6.83	940
21	6.33	420	7.17	1420	6.25	365	6.33	420	6.67	730	6.83	940
22	6.33	420	6.67	730	6.25	365	6.33	420	6.67	730	7.00	1180
23	6.42	490	6.50	555	6.33	420	6.33	420	6.58	630	7.17	1420
24	6.33	420	6.50	555	6.33	420	6.33	420	6.58	630	7.17	1420
25	6.33	420	6.42	490	6.33	420	6.33	420	6.75	830	7.08	1295
26	6.17	320	6.33	420	6.33	420	6.25	365	6.75	330	6.92	1065
27	6.42	490	6.33	420	6.33	420	6.25	365	8.25	3040	6.83	940
28	6.25	365	6.25	365	6.25	365	6.33	420	8.08	2750	7.00	1180
29	6.33	420	6.33	420	6.25	365	6.42	490	7.42	1775	7.00	1180
30	6.33	420	6.33	420	6.25	365	6.42	490	7.42	1775	6.92	1065
31	6.08	275	6.25	365			6.42	490			6.92	1065

Monthly Discharge of Thames River (Main Stream) near Byron for 1914

Drainage Area 1,270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	6,200	730	1,722	4.88	.57	1.36	1.57
June	1,180	730	715	.93	.57	.563	.62
July	630	275	482	.50	.22	.38	.44
August	1,420	275	432	1.12	.22	.34	.39
September	2,500	365	610	1.97	.29	.481	.54
October	490	320	419	.39	.25	.33	.38
November	3,040	420	924	2.39	.33	.73	.81
December	2,750	250	1,351	2.16	.20	1.06	1.22
The period	6,200	250	833	4.88	.20	.65	5.97

Thames River (South Branch) at London

Location.—At McClary's Highway Bridge, near the foot of Adelaide Street, in the city of London, Township of London, County of Middlesex.

Records Available.—Monthly discharge measurements, June, 1913, to Nov., 1914.

Drainage Area.—515 square miles.

Gauge.—Bench mark gauge located on the downstream side of the bridge, painted B.M. on the bottom chord, 7 feet from the right abutment. Assumed elevation of bench mark 40.00 feet.

Channel.—Straight for about ¼ mile above and 1 mile below the station. The banks are low, clean and liable to overflow at high stages. The current is slow. The bed of the stream is composed of clay, a number of large boulders, and is practically permanent. The flow of the river is confined between both abutments of the bridge at all stages.

Discharge Measurements.—Made from the downstream side of the highway bridge with a large Price current meter.

Winter Flow.—During the winter months the river is covered with ice, and measurements are taken through the ice to determine the winter flow.

Control.—This branch enters the main stream of the Thames River, 2 miles below the station. There are no dams above the gauging section. During the winter months the ice causes backwater.

Accuracy.—The gauge heights are unreliable on account of backwater from a dam on the main stream.

Discharge Measurements of Thames River (South Branch) at London in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
June 19....	Murray, W. S...	157	283	0.37	21.13	107	0.21
July 18....	" ...	157	306	0.24	21.20	74	0.14
Aug. 22....	" ...	157	307	0.21	21.30	67	0.04
Sept. 26....	" ...	157	248	0.08	20.90	21	0,41
Oct. 30....	" ...	157	329	0.76	21.45	249	0.48
Nov. 28....	" ...	157	395	1.00	22.00	419	0.81
1914							
Jan. 29....	" ...	155	696	1.13	23.90	987	1.92
Mar. 28....	" ...	155	680	2.62	23.80	1785	3.46
Apr. 30....	" ...	155	522	0.62	22.84	323	0.63
May 28....	" ...	157	467	1.54	22.50	720	1.40
June 24....	" ...	157	221	0.62	20.71	138	0.27
July 29....	" ...	157	292	0.10	21.21	32	0.06
Sept. 1....	" ...	157	367	0.66	21.70	245	0.48
Oct. 27....	" ...	157	393	0.66	21.92	238	0.46
Nov. 27....	" ...	157	394	0.59	21.92	232	0.45

Thames River (North Branch) at London

Location—At the Richmond Street Highway Bridge, in the city of London, Township of London, County of Middlesex.

Records Available—Monthly discharge measurements, June, 1913, to Nov., 1914.

Drainage Area—615 square miles.

Gauge—Bench mark guage (assumed elevation 35.00) located on the upstream side of bridge, painted B. M. on the bottom chord, 15 feet from the right abutment.

Channel—The bed of the stream is composed of clay and gravel which is slightly shifting. The banks are low and liable to overflow. The flow of the river is confined between both abutments of the bridge at all stages.

Discharge Measurements—Made from the upstream side of the highway bridge during ordinary and high stages. At low stages of the river a wading section is used, 100 yards upstream.

Winter Flow—The river is covered with ice during the winter months, and measurements are made through the ice to determine the winter discharge.

Control—A dam about ¼ mile above the station affects the flow somewhat at low stages. Another dam located 4 miles below the section does not interfere with the stage of the river at the station. This branch enters the main stream of the Thames River, 1½ miles downstream.

Discharge Measurements of Thames River (North Branch) at London in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
June 20....	Murray, W. S. ..	63	65	0.92	11.00	60	0.98
July 18....	" ..	65	66	0.56	11.10	37	0.60
Aug. 22....	" ..	70	73	1.79	11.40	132	0.21
Sept. 26....	" ..	50	58	0.20	10.70	12	0.02
Oct. 30....	" ..	62	71	0.63	11.17	45	0.07
Nov. 28....	" ..	....	817	1.05	12.90	865	1.41
1914							
Jan. 29....	" ..	188	1195	1.66	15.30	1994	3.22
Feb. 27(a).	" ..	....	....	....	12.00	nil	....
Mar. 27....	" ..	188	1993	2.97	16.60	5755	9.40
Apr. 30....	" ..	187	704	0.61	12.71	430	0.70
May 28....	" ..	66	85	1.64	11.90	139	0.23
June 24....	" ..	60	69	0.89	11.25	62	0.10
July 29....	" ..	52	63	0.54	10.50	34	0.05
Sept. 1....	" ..	55	85	2.10	11.80	180	0.29
Oct. 27....	" ..	49	52	0.66	10.92	34	0.05
Nov. 27....	" ..	188	838	1.47	13.42	1232	2.01

(a) Ice jam below section

Maitland River at Ben Miller

Location.—At a highway bridge known as the Ben Miller Bridge, in the Village of Ben Miller, about 6 miles southwest of the Town of Goderich, in the Township of Colborne, County of Huron.

Records Available.—May, 1911, to Dec. 31st, 1914.

Drainage Area.—950 square miles.

Gauge.—Vertical steel staff guage with enamelled face, graduated in feet and inches and located on the downstream side of the first pier from the left abutment. The zero on the gauge (elev. 12.00) is referred to a bench mark (elev. 29.07) painted on the downstream side of the right wing wall, in the upper outside corner, and a bench mark (elev. 30.00) on the top of right abutment.

Channel.—Straight for about 300 feet above and ¼ mile below the station. Both banks are low, clean, and liable to overflow at high stages. The bed of the stream is composed of limestone, and will not shift. The current is sluggish at the station, but swift immediately below. The river flows between the piers at the station, forming 3 channels at all stages.

Discharge Measurements.—Made from the bridge at ordinary and high stages. At low stages of the river measurements are made 75 feet below the station by wading.

Control.—There are numerous small dams at the towns and villages above the station at which points the intermittent operation of the mills affect the measurements. A mill situated near the gauging section has a decided effect on the gauge at low stages of the river.

Winter Flow.—During the winter months the river is covered with ice, and measurements are made through the ice, to determine the winter discharge.

Maximum and Minimum Flow.—The highest recorded stage of the river occurred on April 7, 1912, when the height was approximately 9.60 feet above the zero of the present gauge. The corresponding discharge was approximately 65,000 second-feet. In the months of September and October, 1913, and August, 1914, the lowest stage recorded was 0.92 feet above zero of the gauge, the corresponding discharge being approximately 70 second-feet.

Accuracy.—The records for ordinary and high flows are beleived to be good. Owing to the conditions mentioned above, the discharge measurements, taken when the mills were not running, are somewhat low. The rating curve is well defined.

Observer.—E. Pfrimmer, Ben Miller P.O., Ontario.

Discharge Measurements of Maitland River at Ben Miller in 1912-3-4.

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1912							
Jan. 27....	Roberts, E......	....	418	1.80	....	752	....
Feb. 29....	"	....	....	....	....	505	....
Mar. 28....	"	....	784	2.70	15.59	2117	....
Apr. 26....	"	....	645	2.23	14.40	1437	....
May 30....	"	....	1282	4.53	16.13	5815	....
June 27....	"	....	470	0.50	13.47	237	....
July 25....	"	....	575	0.86	13.77	496	....
Aug. 26....	"	....	716	1.30	14.17	929	....
Sept. 26....	"	....	788	1.78	14.37	1405	....
Oct. 29....	"	....	656	1.26	13.97	824	....
Nov. 27....	"	....	788	1.72	14.37	1356	....
Dec. 22....	"	....	717	1.31	14.17	938	....
1913							
Jan. 26....	"	....	1226	4.11	15.57	5042	....
Feb. 25....	"	....	824	1.92	14.47	1590	....
Mar. 25....	"	....	2122	7.39	18.07	15688	....
Apr. 23....	"	....	646	1.19	13.95	771	....
May 21....	"	....	530	0.76	13.67	407	....
June 18....	Murray, W. S...	108	62	1.75	13.15	108	....
July 17....	" ...	116	50	1.08	13.07	93	....
Aug. 21....	" ...	111	55	1.71	13.00	94	....
Sept. 25 (a)	" ...	134	72	1.16	13.15	84	....
Oct. 29....	" ...	345	493	0.78	13.60	389	....
Nov. 26....	" ...	....	813	1.96	14.45	1591	....
Dec. 28....	" ...	....	579	0.85	13.80	492	....
1914							
Jan. 28 (b)	" ...	360	929	1.05	14.72	1474	....
Feb. 25 (c)	" ...	340	524	0.72	14.35	380	....
Mar. 24....	" ...	351	837	2.14	14.55	1798	....
Apr. 29....	" ...	352	640	1.43	14.00	920	....
May 28....	" ...	352	489	0.71	13.54	347	....
June 23....	" ...	303	165	1.28	13.34	213	....
July 29 (a)	" ...	96	41	1.15	13.04	43	....
Aug. 31 (a)	" ...	102	56	1.22	13.16	68	....
Sept. 28 (a)	" ...	116	62	1.40	13.16	87	....
Oct. 26 (a)	" ...	155	65	1.30	13.16	84	....
Nov. 27....	" ...	350	693	1.34	14.14	932	....

(a) When the mill near the station is not running the discharge measurements are affected at low stages

(b) Ice on control

(c) Ice jam

Maitland River at Ben Miller

Location—At a highway bridge known as the Ben Miller Bridge, in the Village of Ben Miller, about 6 miles southwest of the Town of Goderich, in the Township of Colborne, County of Huron.

Records Available—May, 1911, to Dec. 31st, 1914.

Drainage Area—950 square miles.

Gauge—Vertical steel staff guage with enamelled face, graduated in feet and inches and located on the downstream side of the first pier from the left abutment. The zero on the gauge (elev. 12.00) is referred to a bench mark (elev. 29.07) painted on the downstream side of the right wing wall, in the upper outside corner, and a bench mark (elev. 30.00) on the top of right abutment.

Channel—Straight for about 300 feet above and ¼ mile below the station. Both banks are low, clean, and liable to overflow at high stages. The bed of the stream is composed of limestone, and will not shift. The current is sluggish at the station, but swift immediately below. The river flows between the piers at the station, forming 3 channels at all stages.

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Maximum and Minimum Flow—The highest recorded stage of the river occurred on April 7, 1912, when the height was approximately 9.60 feet above the zero of the present gauge. The corresponding discharge was approximately 65,000 second-feet. In the months of September and October, 1913, and August, 1914, the lowest stage recorded was 0.92 feet above zero of the gauge, the corresponding discharge being approximately 70 second-feet.

Accuracy—The records for ordinary and high flows are beleived to be good. Owing to the conditions mentioned above, the discharge measurements, taken when the mills were not running, are somewhat low. The rating curve is well defined.

Observer—E. Pfrimmer, Ben Miller P.O., Ontario.

Discharge Measurements of Maitland River at Ben Miller in 1912-3-4.

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
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Feb. 29....	"	....	....	....	....	505	....
Mar. 28....	"	....	784	2.70	15.59	2117	....
Apr. 26....	"	....	645	2.23	14.40	1437	....
May 30....	"	....	1282	4.53	16.13	5815	....
June 27....	"	....	470	0.50	13.47	237	....
July 25....	"	....	575	0.86	13.77	496	....
Aug. 26....	"	....	716	1.30	14.17	929	....
Sept. 26....	"	....	788	1.78	14.37	1405	....
Oct. 29....	"	....	656	1.26	13.97	824	....
Nov. 27....	"	....	788	1.72	14.37	1356	....
Dec. 22....	"	....	717	1.31	14.17	938	....
1913							
Jan. 26....	"	....	1226	4.11	15.57	5042	....
Feb. 25....	"	....	824	1.92	14.47	1590	....
Mar. 25....	"	....	2122	7.39	18.07	15688	....
Apr. 23....	"	....	646	1.19	13.95	771	....
May 21....	"	....	530	0.76	13.67	407	....
June 18....	Murray, W. S...	108	62	1.75	13.15	108	....
July 17....	" ...	116	50	1.08	13.07	93	....
Aug. 21....	" ...	111	55	1.71	13.00	94	....
Sept. 25 (a)	" ...	134	72	1.16	13.15	84	....
Oct. 29....	" ...	345	493	0.78	13.60	389	....
Nov. 26....	" ...	....	813	1.96	14.45	1591	....
Dec. 28....	" ...	....	579	0.85	13.80	492	....
1914							
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Feb. 25 (c)	" ...	340	524	0.72	14.35	380	....
Mar. 24....	" ...	351	837	2.14	14.55	1798	....
Apr. 29....	" ...	352	640	1.43	14.00	920	....
May 28....	" ...	352	489	0.71	13.54	347	....
June 23....	" ...	303	165	1.28	13.34	213	....
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Aug. 31 (a)	" ...	102	56	1.22	13.16	68	....
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Oct. 26 (a)	" ...	155	65	1.30	13.16	84	....
Nov. 27....	" ...	350	693	1.34	14.14	932	....

(a) When the mill near the station is not running the discharge measurements are affected at low stages
(b) Ice on control
(c) Ice jam

Daily Gauge Height and Discharge of Maitland River at Ben Miller for 1911

Drainage Area, 950 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	...	...	...	...	...	...	...	...	...	...	13.63	355	13.30	140	13.34	155	13.22	115	13.72	450	13.93	700	15.26	3525
2	...	...	...	...	...	...	...	...	...	...	13.59	325	13.26	125	13.32	150	13.22	115	13.80	525	13.97	800	15.05	2950
3	...	...	...	...	...	...	...	...	...	...	13.72	450	13.32	115	13.30	140	13.22	115	13.80	525	14.01	850	14.76	2225
4	...	...	...	...	...	...	...	...	...	...	13.63	355	13.20	110	13.55	285	13.22	115	13.80	525	13.97	800	14.38	1380
5	...	...	...	...	...	...	...	...	...	...	13.72	450	13.18	105	13.55	285	13.22	115	13.76	500	14.01	850	14.30	1235
6	...	...	...	...	...	...	...	...	...	...	13.63	355	13.30	140	13.38	175	13.30	140	13.76	500	14.01	850	14.38	1380
7	...	...	...	...	...	...	...	...	...	...	13.59	325	13.43	205	13.38	175	13.30	140	13.72	450	14.30	1230	14.30	1235
8	...	...	...	...	...	...	...	...	...	...	13.61	335	13.36	165	13.43	205	13.34	155	13.68	400	14.55	1750	14.38	1380
9	...	...	...	...	...	...	...	...	...	...	13.63	355	13.38	175	13.38	175	13.34	155	13.63	355	15.05	2950	14.88	2550
10	...	...	...	...	...	...	...	...	...	...	13.61	335	13.38	175	13.38	175	13.34	155	13.63	355	14.88	2550	15.22	3400
11	...	...	...	...	...	...	...	...	...	...	13.61	335	13.30	140	13.38	175	13.34	155	13.68	400	14.88	2550	15.72	4950
12	...	...	...	...	...	...	...	...	...	...	13.63	355	13.26	125	13.38	175	13.43	205	13.72	450	15.05	2950	15.68	4900
13	...	...	...	...	...	...	...	...	...	...	13.76	500	13.24	120	13.38	175	13.47	225	13.63	355	15.05	2950	15.59	4550
14	...	...	...	...	...	...	...	...	...	...	13.80	525	13.22	115	13.34	155	13.47	225	13.59	325	14.97	2800	15.22	3400
15	...	...	...	...	...	...	...	...	...	...	13.84	570	13.20	110	13.30	140	13.47	225	13.55	285	14.88	2550	14.97	2800
16	...	...	...	...	...	...	...	...	...	...	13.76	500	13.22	115	13.34	155	13.43	205	13.55	285	14.76	2225	14.76	2225
17	...	...	...	...	...	...	...	...	...	...	13.76	450	13.47	225	13.43	205	13.43	205	13.55	285	14.72	2150	14.63	1950
18	...	...	...	...	...	...	...	...	...	...	13.63	355	13.53	270	13.38	175	13.38	175	13.63	355	15.22	3400	14.51	1650
19	...	...	...	...	...	...	...	...	...	...	13.50	245	13.40	185	13.34	155	13.38	175	13.76	500	15.26	3525	14.47	1600
20	...	...	...	...	...	...	...	...	...	...	13.47	225	13.59	325	13.30	140	13.34	155	13.88	615	15.30	3550	14.38	1380
21	...	...	...	...	...	...	...	...	...	...	13.43	205	13.43	205	13.26	125	13.34	155	13.80	525	15.26	3525	14.13	1000
22	...	...	...	...	...	...	...	...	...	...	13.38	175	13.36	165	13.25	125	13.34	155	13.93	685	15.22	3400	14.30	1300
23	...	...	...	...	...	...	...	...	...	...	13.38	175	13.30	140	13.24	120	13.38	175	14.22	1100	15.13	3200	14.47	1600
24	...	...	...	...	...	...	...	...	...	...	13.38	175	13.38	175	13.24	120	13.38	175	14.47	1600	15.01	2900	14.55	1750
25	...	...	...	...	...	...	...	...	...	...	13.38	175	13.38	175	13.26	125	13.38	175	14.43	1500	14.93	2675	14.47	1600
26	...	...	...	...	...	...	...	...	...	...	13.38	175	13.43	205	13.30	140	13.38	175	14.34	1350	14.76	2225	14.43	1500
27	...	...	...	...	...	...	...	...	...	...	13.36	165	13.43	205	13.30	140	13.47	225	14.22	1150	14.68	2050	14.38	1380
28	...	...	...	...	...	...	...	...	...	...	13.36	165	13.38	175	13.30	140	13.55	285	14.09	925	15.05	2950	14.26	1225
29	...	...	...	...	...	...	...	...	...	...	13.34	155	13.30	140	13.22	115	13.55	285	14.01	850	15.55	4425	14.18	1100
30	...	...	...	...	...	...	...	...	...	...	13.32	150	13.38	175	13.18	105	13.63	355	13.97	800	15.51	4300	14.18	1100
31	...	...	...	...	...	...	...	...	...	...	...	...	13.38	175	13.22	115	...	...	13.93	700	...	...	14.97	2800

Daily Gauge Height and Discharge of Maitland River at Ben Miller for 1912

Drainage Area, 950 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	14.68	2050	......	.....	......	4900	16.47	8875	13.88	620	14.93	2820
2	14.73	2250	......	.....	......	4900	16.72	9950	13.72	440	14.63	1990
3	14.72	2150	......	.....	15.47	4600	16.55	9200	13.76	480	14.63	1990
4	14.84	2550	......	.....	15.47	4600	16.55	9200	13.84	570	15.22	3700
5	14.13	1020	......	.....	15.38	4300	16.63	9600	13.80	525	15.13	3400
6	14.47	1570	......	.....	15.30	3950	20.26	41600	13.84	570	14.80	2450
7	15.80	6000	......	.....	15.22	3700	21.60	65000	13.80	525	14.55	1800
8	16.22	7800	......	.....	15.13	3400	20.22	41100	13.84	570	14.47	1570
9	16.22	7800	......	.....	15.09	3300	17.88	15000	13.84	570	14.30	1230
10	16.13	7450	......	.....	15.09	3300	17.05	11400	13.80	525	14.13	965
11	16.09	7275	......	.....	15.05	3175	16.55	9200	13.76	480	13.97	740
12	16.01	6900	......	.....	15.05	3175	16.05	7000	13.80	525	13.97	740
13	15.97	6750	......	.....	15.05	3175	15.80	6000	13.88	620	13.88	620
14	15.97	6750	......	.....	14.97	2950	15.55	4950	14.13	965	13.84	570
15	15.88	6375	......	.....	14.97	2950	15.72	5650	14.63	1990	13.80	525
16	15.84	6175	......	.....	14.97	2950	15.63	5275	14.55	1800	13.80	525
17	15.80	6000	......	.....	14.97	2950	15.46	4600	14.55	1800	13.76	480
18	15.80	6000	......	.....	14.80	2450	15.30	3950	14.63	1990	13.72	440
19	15.76	5825	......	.....	14.88	2680	15.18	3575	14.89	2690	13.68	400
20	15.84	6175	......	.....	14.97	2950	15.01	3050	15.30	3950	13.68	400
21	15.88	6375	......	.....	14.80	2450	14.76	2490	16.13	7450	13.59	325
22	15.88	6375	......	.....	15.38	4300	14.68	2100	17.38	12800	13.55	285
23	15.84	6175	......	.....	15.38	4300	14.55	1800	17.30	12400	13.51	255
24	15.84	6175	......	.....	15.47	4600	14.47	1570	16.97	11000	13.47	225
25	15.84	6175	......	.....	15.47	4600	14.42	1465	16.63	9600	13.43	205
26	15.84	6175	......	.....	15.51	4775	14.38	1380	16.05	7000	13.47	225
27	......	6000	......	.....	15.59	5100	14.22	1100	15.80	6000	13.47	225
28	......	6000	......	.....	15.59	5100	14.18	1040	15.63	5275	13.47	225
29	......	5700	......	.....	15.63	5275	14.05	785	15.30	3950	13.46	220
30	......	5500	......	.....	15.88	6375	13.97	740	16.13	7450	13.43	205
31	......	5100	......	.....	16.30	8150	......	.....	15.38	4300	......	.....

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	13.43	205	13.43	205	15.13	3400	14.47	1570	14.47	1570	14.39	1425
2	13.39	180	13.39	180	15.97	6750	14.51	1665	15.05	3175	14.72	2250
3	13.39	180	13.47	225	15.80	6000	14.47	1570	15.30	3950	15.22	3700
4	13.39	180	13.43	205	15.38	4300	14.34	1310	15.39	4350	16.05	7000
5	13.34	165	13.39	180	14.97	2950	14.13	1020	15.22	3700	15.63	5275
6	13.34	165	13.39	180	14.63	1990	14.09	905	15.26	3900	15.68	5500
7	13.34	165	13.34	165	14.38	1380	14.05	850	16.40	8600	15.47	4600
8	13.30	140	13.39	180	14.22	1100	13.97	740	16.30	8150	15.22	3700
9	13.39	180	13.43	205	14.09	905	13.88	620	16.13	7450	14.76	2490
10	13.39	180	13.43	205	13.97	740	14.01	785	15.88	6375	13.72	440
11	13.39	180	13.47	225	13.88	620	14.13	1020	15.55	4950	13.97	740
12	13.34	165	13.55	285	13.80	525	14.30	1230	15.30	3950	14.09	905
13	13.34	165	13.72	440	13.72	440	14.34	1310	15.47	4600	14.13	965
14	13.34	165	13.63	355	13.72	440	14.30	1230	16.80	10300	14.43	1485
15	13.34	165	13.55	285	13.80	525	14.26	1165	16.22	7800	14.59	1885
16	13.39	180	13.47	225	14.01	785	14.09	905	15.76	5825	14.72	2250
17	13.39	180	13.43	205	14.13	965	14.01	785	15.39	4350	14.63	1990
18	13.34	165	13.51	255	14.22	1100	13.97	740	15.13	3400	14.51	1660
19	13.30	140	13.47	225	14.30	1230	14.13	1020	14.97	2950	14.43	1485
20	13.30	140	13.47	225	14.42	1465	14.51	1660	14.82	2500	14.30	1230
21	13.47	225	13.80	525	14.47	1570	14.42	1465	14.72	2250	14.26	1165
22	13.63	355	13.88	620	14.42	1465	14.30	1230	14.68	2100	14.17	1025
23	13.63	355	14.01	785	14.47	1570	14.30	1230	14.49	1610	14.13	965
24	13.76	480	14.01	785	14.38	1380	14.26	1165	14.47	1570	14.05	850
25	13.76	480	14.09	905	14.34	1310	14.18	1040	14.47	1570	14.09	905
26	13.72	440	14.13	965	14.34	1210	14.09	905	14.43	1485	14.09	905
27	13.63	355	13.97	740	14.38	1380	14.09	905	14.41	1445	13.97	740
28	13.51	255	13.88	620	14.38	1380	14.05	850	14.39	1425	13.97	740
29	13.43	205	13.84	570	14.42	1465	13.99	765	14.34	1310	13.97	740
30	13.34	165	13.80	525	14.47	1570	13.97	740	14.30	1230	13.93	680
31	13.43	205	13.72	440	......	.....	13.93	680	......	.....	13.89	635

Daily Gauge Height and Discharge of Maitland River at Ben Miller for 1913

Drainage Area, 950 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	13.93	680	14.80	2450	14.55	1880	16.55	9200	14.05	785	13.45	215	13.30	140	13.05	80	13.09	90	13.05	80	13.68	405	14.18	1070
2	14.05	785	14.63	1990	14.47	1570	15.63	5275	13.97	740	13.45	215	13.28	130	13.05	80	13.09	90	13.05	80	13.68	405	14.13	1010
3	14.05	785	14.53	1800	14.30	1230	15.92	6500	13.89	630	13.45	215	13.24	120	13.11	90	13.05	80	13.09	90	13.72	440	14.05	885
4	14.01	800	14.47	1570	14.22	1100	17.72	14200	13.76	480	13.43	205	13.30	140	13.05	80	13.05	80	13.09	90	13.72	440	14.01	800
5	13.92	670	14.39	1425	14.13	965	17.34	12600	13.72	440	13.43	205	13.30	140	13.03	75	13.05	80	13.11	90	13.72	440	13.97	750
6	14.18	1040	14.34	1310	13.97	740	16.30	8150	13.72	440	13.37	175	13.30	140	13.03	75	13.05	80	13.11	90	13.63	355	13.92	700
7	14.22	1100	14.30	1230	13.84	570	15.59	5100	13.68	400	13.37	175	13.26	125	13.03	75	13.05	80	13.09	90	13.63	355	14.01	800
8	14.30	1230	14.30	1230	13.72	440	15.22	3700	13.64	360	13.37	175	13.22	115	13.03	75	13.05	80	13.01	70	13.68	400	13.97	750
9	14.43	1485	14.30	1230	13.97	740	15.05	3175	13.64	360	13.37	175	13.22	115	13.24	120	13.05	80	12.97	70	13.72	440	13.97	750
10	14.47	1570	14.30	1230	14.30	1230	15.30	3950	13.60	330	13.34	165	13.22	115	13.42	195	13.05	80	12.97	70	13.80	525	13.92	700
11	14.55	1880	14.30	1230	14.55	1880	16.55	9200	13.55	285	13.34	165	13.13	95	13.42	195	13.05	80	13.26	125	13.80	525	13.92	700
12	14.77	2200	14.26	1165	14.84	570	16.38	8500	13.55	285	13.34	165	13.20	110	13.17	100	13.09	90	13.34	155	14.05	785	13.92	700
13	14.41	1445	14.22	1100	15.30	3950	16.13	7450	13.59	325	13.34	165	13.26	125	13.17	100	13.09	90	13.30	140	14.13	965	14.09	920
14	14.39	1425	14.14	980	17.18	11950	15.55	4950	13.59	325	13.34	165	13.24	120	13.15	100	13.09	90	13.17	100	14.18	1040	14.09	920
15	14.39	1425	14.14	980	19.72	34200	14.93	2820	13.59	325	13.32	150	13.07	85	13.13	95	12.97	70	13.17	100	14.18	1040	14.05	885
16	15.47	4600	14.14	980	17.80	14550	14.72	2250	13.59	325	13.26	125	13.07	85	13.13	95	13.05	80	13.13	95	14.13	965	14.05	885
17	17.05	11400	14.09	905	16.97	11000	14.55	1880	13.59	325	13.26	125	13.07	85	13.09	95	13.09	90	13.22	115	14.13	965	14.01	800
18	17.22	12100	14.05	850	16.30	8150	14.38	1380	13.59	325	13.22	115	13.07	85	13.13	95	13.09	90	13.30	140	14.22	1100	14.01	800
19	16.89	10700	14.22	1100	15.80	6000	14.30	1230	13.64	360	13.34	115	13.18	105	13.05	80	13.09	90	13.34	155	15.55	4950	14.01	800
20	16.72	9950	14.47	1570	16.22	7800	14.22	1100	13.64	360	13.37	175	13.17	100	13.13	95	13.17	100	13.34	155	15.97	6750	13.97	750
21	16.72	9950	14.47	1570	16.47	8875	14.13	965	13.64	360	13.34	165	13.13	95	13.15	100	13.17	100	13.38	175	15.59	5100	13.97	750
22	16.55	9200	14.66	2025	16.34	8325	14.09	905	13.64	360	13.30	140	13.13	95	13.13	95	13.13	95	13.42	195	15.09	3300	......	750
23	16.34	8350	15.38	4300	16.55	9200	14.13	965	13.59	325	13.30	140	13.13	95	13.13	95	13.09	90	13.51	255	14.89	2700	......	730
24	16.13	7450	15.01	3050	15.11	3200	14.09	905	13.59	325	13.32	150	13.13	95	13.15	100	13.07	85	13.80	525	14.76	2250	......	750
25	15.76	5825	15.01	3050	18.05	16700	14.09	905	13.55	285	13.32	150	13.11	90	13.15	100	13.17	100	13.80	525	14.63	1990	......	780
26	15.55	4950	14.89	2690	17.47	13500	14.13	965	13.55	285	13.30	140	13.11	90	13.13	95	13.13	95	13.74	460	14.55	1880	......	780
27	15.30	3950	14.80	2450	16.30	8150	14.22	1100	13.55	285	13.32	150	13.11	90	13.13	95	13.13	95	13.66	380	14.38	1390	......	730
28	15.09	3300	14.68	2100	16.05	7100	14.22	1100	13.57	300	13.32	150	13.11	90	13.13	95	13.11	90	13.59	320	14.28	1200	......	550
29	14.84	2550	......	.....	15.92	6500	14.18	1040	13.51	255	13.30	140	13.09	90	13.11	90	12.99	70	13.63	355	14.13	965	13.80	492
30	14.72	2250	......	.....	15.80	6000	14.09	905	13.47	225	13 32	150	13.09	90	13.11	90	13.05	80	13.63	355	14.13	965	......	530
31	14.97	2950	......	.....	16.05	7100	......	.....	13.47	225	......	.....	13.09	90	13.11	90	......	.....	13.63	355	......	.....	......	630

Daily Gauge Height and Discharge of Maitland River at Ben Miller for 1914

Drainage Area, 950 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	......	620	15.39	4300	14.22	1100	16.63	9600	13.92	670	13.56	295	13.40	185	13.02	78	13.33	150	13.13	95	13.31	145	14.35	1330
2	......	620	15.22	3590	14.26	1160	16.63	9600	13.92	670	13.44	205	13.40	185	13.02	78	13.33	150	13.17	103	13.31	145	14.48	1590
3	......	650	15.01	3050	14.26	1160	16.22	7800	13.92	670	13.42	195	13.30	140	13.00	76	13.38	175	13.17	103	13.38	175	14.44	1505
4	......	720	14.89	2710	14.26	1160	15.72	5680	14.00	780	13.60	328	13.38	175	13.00	76	13.38	175	13.13	95	13.42	195	14.33	1290
5	......	650	14.72	2100	14.28	1200	15.30	3900	14.00	780	13.67	392	13.33	150	13.00	76	13.38	175	13.17	103	13.48	235	14.25	1155
6	......	700	14.60	1880	14.22	1100	14.96	2910	14.00	780	13.67	392	13.29	135	13.04	80	13.42	195	13.13	95	13.50	245	14.17	1030
7	......	730	14.47	1570	14.22	1100	14.72	2100	14.08	895	13.60	328	13.25	125	12.92	70	13.42	195	13.17	103	13.46	220	13.96	725
8	......	720	13.88	618	14.22	1100	14.63	1880	13.92	665	13.52	262	13.25	125	12.92	70	13.38	175	13.00	76	13.42	195	13.81	535
9	......	700	14.09	910	14.22	1100	14.55	1770	13.83	560	13.44	205	13.20	110	12.92	70	13.38	175	13.13	95	13.42	195	13.83	560
10	......	680	14.13	964	14.22	1100	14.38	1385	13.75	470	13.33	150	13.17	103	13.00	76	13.33	150	13.25	125	13.46	220	13.92	665
11	13.89	630	14.18	1040	14.22	1100	14.38	1385	13.67	392	13.38	175	13.19	107	13.08	85	13.33	150	13.33	150	13.46	220	14.00	780
12	13.72	440	14.22	1100	14.22	1100	14.34	1310	13.75	470	13.33	150	13.20	110	13.08	85	13.29	135	13.29	135	13.42	195	13.83	560
13	13.72	440	14.22	1100	14.13	964	14,30	1233	13.71	430	13.29	135	13.29	135	13.08	85	13.29	135	13.29	135	13.50	245	13.80	524
14	13.72	440	14.22	1100	13.89	630	14.30	1233	13.67	392	13.25	125	13.38	175	13.04	80	13.25	125	13.25	125	13.62	345	13.78	500
15	13.89	630	14.18	1040	14.13	964	14.26	1163	13.67	392	13.33	150	13.38	175	13.04	80	13.21	112	13.25	125	13.58	314	13.78	500
16	14.01	790	14.13	964	14.89	2710	14.22	1100	13.58	314	13.25	125	13.38	175	13.12	93	13.17	103	13.29	135	14.12	960	13.80	524
17	14.05	850	14.09	910	15.47	4600	14.22	1100	13.58	314	13.25	125	13.33	150	13.15	100	13.17	103	13.33	150	14.17	1030	13.80	524
18	14.05	850	14.01	790	15.47	4600	14.13	964	13.54	280	13.25	125	13.27	130	13.17	103	13.15	100	13.33	150	13.92	670	13.84	570
19	14.09	910	14.01	790	15.47	4600	14.22	1100	13.54	280	13.35	160	13.21	112	13.29	135	13.17	103	13.27	130	13.92	670	14.09	910
20	14.14	980	14.05	850	15.38	4260	14.26	1170	13.54	280	13.29	135	13.19	107	13.54	280	13.25	125	13.29	135	13.88	618	14.13	964
21	14.16	1010	14.09	910	15.30	3900	14.26	1170	13.42	195	13.29	135	12.17	103	13.54	280	13.17	103	13.25	125	13.81	535	14.17	1030
22	14.20	1070	14.13	964	15.13	3400	14.22	1100	13.50	245	13.29	135	13.17	103	13.48	235	13.17	103	13.29	135	13.81	535	14.17	1030
23	14.18	1040	14.22	1100	14.92	2790	14.13	964	13.46	220	13.33	150	13.17	103	13.35	160	13.25	125	13.25	125	13.81	535	14.13	964
24	14.22	1100	14.22	1100	14.55	1770	14.05	850	13.50	245	13.42	195	13.13	95	13.29	135	13.21	112	13.25	125	13.83	560	14.13	964
25	14.55	1770	14.26	1160	14.63	1880	13.97	740	13.54	280	13.42	195	13.13	95	13.21	112	13.17	103	13.25	125	14.00	780	14.17	1030
26	14.64	1900	14.26	1160	15.13	3400	13.96	725	13.54	280	13.38	175	13.08	85	13.17	103	13.17	103	13.17	103	14.15	995	14.22	1100
27	14.64	1900	14.05	850	16.55	9240	14.01	795	13.56	295	12.38	175	13.08	85	13.13	95	13.17	103	13.17	103	14.42	1465	14.22	1100
28	14.72	2100	14.05	850	17.05	11380	14.01	795	13.58	314	13.42	195	13.04	80	13.13	95	13.17	103	13.25	125	14.50	1530	14.22	1100
29	15.14	3410	......	.....	17.05	11380	14.00	780	13.58	314	13.40	185	13.06	82	13.21	112	13.19	107	13.29	135	14.42	1465	14.30	1233
30	15.80	6020	......	.....	17.63	13830	14.00	780	13.63	355	13.40	185	13.02	78	13.21	112	13.19	107	13.46	220	14.29	1220	14.30	1233
31	15.55	4950	......	.....	17.63	13830	......	.....	13.58	314	......	.....	13.02	78	13.21	112	......	.....	13.27	130	......	.....	14.30	1233

Monthly Discharge of Maitland River at Ben Miller for 1911

Drainage Area, 950 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January							
February							
March							
April							
May							
June	570	150	314	.60	.16	.33	.37
July	325	105	165	.34	.11	.17	.20
August	285	105	159	.30	.11	.17	.20
September	355	115	181	.37	.12	.19	.21
October	1,600	285	634	1.68	.30	.67	.76
November	4,425	700	2,455	4.67	.74	2.58	2.88
December	4,950	1,000	2,161	5.21	1.05	2.28	2.63
The period	4,950	105	867	5.21	.11	.91	7.25

Monthly Discharge of Maitland River at Ben Miller for 1912

Drainage Area, 950 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	7,800	1,020	5,500	8.22	1.07	5.80	6.68
February							
March	8,150	2,450	4,040	8.58	2.58	4.25	4.90
April	65,000	740	9,630	68.45	0.78	10.10	11.27
May	12,800	440	3,530	13.47	0.46	3.72	4.29
June	3,700	205	992	3.89	0.22	1.04	1.16
July	480	140	222	0.50	0.15	0.23	.27
August	965	165	392	1.01	0.17	0.41	.47
September	6,750	440	1,732	7.10	0.46	1.82	2.03
October	1,665	620	1,066	1.75	0.65	1.12	1.29
November	10,300	1,230	3,910	10.82	1.29	4.12	4.60
December	7,000	440	1,945	7.37	0.46	2.04	2.35
The period	65,000	140	2,996	68.45	0.15	3.15	39.31

Monthly Discharge of Maitland River at Ben Miller for 1913

Drainage Area, 950 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	12,100	670	4,125	12.72	.70	4.34	5.00
February	4,300	850	1,700	4.52	.89	1.79	1.86
March	34,200	440	6,620	35.95	.46	6.97	8.05
April	14,200	905	4,075	14.94	.95	4.29	4.79
May	785	225	369	.83	.24	.39	.45
June	215	115	162	.23	.12	.17	.19
July	140	85	106	.15	.09	.11	.13
August	195	75	98	.21	.08	.10	.12
September	100	70	86	.11	.07	.09	.10
October	525	70	193	.55	.07	.20	.23
November	6,750	355	1,501	7.11	.37	1.58	1.76
December	1,070	492	764	1.13	.52	.80	.92
The year	34,200	70	1,650	35.95	.07	1.74	23.60

Monthly Discharge of Maitland River at Ben Miller for 1914

Drainage Area, 950 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	6,020	440	1,291	6.34	.463	1.36	1.57
February	4,300	618	1,409	4.52	.651	1.48	1.54
March	13,830	630	3,664	14.56	.664	3.86	4.45
April	9,600	725	2,236	10.11	.763	2.35	2.62
May	895	195	437	.942	.205	.46	.53
June	392	125	196	.413	.132	.21	.23
July	185	78	122	.195	.082	.13	.15
August	280	70	111	.295	.074	.12	.14
September	195	100	133	.205	.105	.14	.16
October	220	76	123	.232	.080	.13	.15
November	1,530	145	562	1.611	.153	.59	.65
December	1,590	500	928	1.675	.527	.98	1.13
The year	13,830	70	932	14.56	.074	.98	13.32

Saugeen River near Port Elgin

Location—At the highway bridge known as McCalder's Bridge, 4 miles north-east of the Town of Pt. Elgin, Township of Saugeen, County of Bruce.

Records Available—Monthly discharge measurements, July, 1911, to July, 1914. Daily gauge heights, April 19 to Dec. 31, 1914.

Drainage Area—1,565 square miles.

Gauge—Two sections of vertical steel staff with enamelled face, graduated in feet and inches. The 0 to 3 feet section is fastened to the upstream side of the centre pier and the 3 to 12 feet section, which records the high stages of the river, is placed on the right abutment. The zero of the gauge (elevation 4.00) is referred to a bench mark on the downstream side of the right abutment.

Channel—Straight for about 500 feet above and 700 feet below the station. Both banks are low, clean and liable to overflow. The bed of the stream is composed of boulders and clay, slightly shifting. The current is moderate and flows through two channels, which are separated by the centre pier of the bridge.

Discharge Measurements—Made from the highway bridge with a large Price current meter.

Control—The operation of numerous small dams located above the station cause fluctuation in the river, due to the intermittent operation of the mills.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge.

Maximum and Minimum Flow—On April 8, 1912, the high water rose 20 feet above the zero of the present gauge, causing heavy damage along the banks of the river. The discharge recorded on April 12th was 19,436 second-feet at a gauge height of 13.80 feet. The lowest stage recorded was 4.50 feet on Aug. 19, 1913, when the flow was about 361 second-feet.

Accuracy—The large number of discharge measurements made it possible to establish a well-defined rating curve.

Observer—John Shanks, Southampton, Ontario.

Discharge Measurements of Saugeen River near Port Elgin in 1911-2-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1911							
July 7....	Roberts, E	197	544	0.90	4.65	490	....
Aug. 17....	"	197	525	0.76	4.55	399	....
Sept. 20....	"	197	544	0.92	4.65	506	....
Oct. 13....	"	197	629	1.09	5.10	691	....
Nov. 17....	"	197	1154	4.07	7.70	4704	....
Dec. 20....	"	197	993	1.58	6.90	1473	....
1912							
Jan. 25....	"	....	849	2.30	6.20	2308	....
Feb. 24....	"	....	672	1.30	5.30	876	....
Mar. 27....	"	....	1007	1.91	7.00	1922	....
Apr. 10 (a)	"	....	2346	8.30	13.80	19436	....
Apr. 25....	"	....	1243	3.25	8.20	4028	....
May 29....	"	....	1243	3.49	8.20	4323	....
June 26....	"	....	847	1.26	5.70	1066	....
July 23....	"	....	847	1.32	5.70	1116	....
Aug. 25....	"	....	919	1.62	6.10	1482	....
Sept. 25....	"	....	1004	1.95	6.50	1965	....
Oct. 27....	"	....	924	1.63	6.10	1502	....
Nov. 26....	"	....	1143	2.53	7.20	2883	....
Dec. 21....	"	....	1143	2.53	7.20	2881	....
1913							
Jan. 25....	"	....	1694	3.70	10.00	6273	....
Feb. 23....	"	....	1812	1.50	10.60	2816	....
Mar. 23 (b)	"	....	2087	5.07	12.00	10506	....
Apr. 21....	"	....	1182	3.28	7.40	3887	....
May 21....	"	....	906	1.56	6.00	1416	....
June 16....	Murray, W. S. .	197	787	1.16	5.28	920	....
July 15....	"	197	729	0.90	5.10	663	....
Aug. 19....	"	197	615	0.58	4.50	361	....
Sept. 23....	"	197	635	0.60	4.60	386	....
Oct. 27....	"	197	874	1.03	5.75	897	....
Nov. 24....	"	197	1260	3.46	7.80	3097	....
Dec. 30....	"	197	602	1.63	5.60	986	....
1914							
Jan. 27....	"	197	1037	1.48	6.70	1540	....
Feb. 24....	"	197	1038	0.96	6.80	1001	....
Mar. 26....	"	194	1557	2.82	8.70	4394	....
Apr. 28....	"	194	984	1.69	6.40	1660	....
May 27....	"	197	787	1.27	5.37	984	....
June 23....	"	197	697	0.94	4.95	659	....
July 24....	"	195	625	0.72	4.50	450	....

(a) Gauge height 20.0 feet on April 8, 1912, at peak of flood
(b) Float measurement

Daily Gauge Height and Discharge of Saugeen River near Port Elgin for 1914

Drainage Area 1,565 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	......	......	......	......	......	......	......	7.00	2,490	5.25	880	5.08	750	4.50	370	4.67	470	4.58	400	4.75	520	6.44	1,890
2	......	......	......	......	......	......	......	......	6.83	2,300	5.17	820	5.08	750	4.42	300	4.67	470	4.58	400	4.83	575	6.42	1,860
3	......	......	......	......	......	......	......	......	6.67	2,120	5.08	750	5.00	690	4.33	250	4.75	520	4.46	320	4.83	575	6.29	1,750
4	......	......	......	......	......	......	......	......	6.42	1,860	5.00	690	5.00	690	4.33	250	4.75	520	4.50	370	4.96	650	6.19	1,650
5	......	......	......	......	......	......	......	......	6.42	1,860	5.00	690	4.92	640	4.50	370	4.75	520	4.50	370	4.96	650	6.00	1,480
6	......	......	......	......	......	......	......	......	6.42	1,860	5.00	690	4.92	640	4.50	370	4.75	520	4.50	370	4.92	640	5.94	1,430
7	......	......	......	......	......	......	......	......	6.17	1,690	5.00	690	4.83	575	4.33	250	4.67	470	4.50	370	4.92	640	5.88	1,380
8	......	......	......	......	......	......	......	......	6.17	1,690	5.00	690	4.83	575	4.33	250	4.67	470	4.58	400	4.92	640	5.83	1,330
9	......	......	......	......	......	......	......	......	6.00	1,480	5.00	690	4.83	575	4.33	250	4.67	470	4.67	470	4.96	650	5.77	1,280
10	......	......	......	......	......	......	......	......	5.92	1,420	5.00	690	4.75	520	4.33	250	4.58	400	4.75	520	4.92	640	5.67	1,220
11	......	......	......	......	......	......	......	......	5.93	1,340	5.00	690	4.75	520	4.42	300	4.58	400	4.92	640	4.88	610	5.62	1,170
12	......	......	......	......	......	......	......	......	5.75	1,270	5.00	690	4.75	520	4.50	370	4.58	400	5.08	750	4.92	640	5.46	1,050
13	......	......	......	......	......	......	......	......	5.67	1,220	5.00	690	4.67	470	4.58	400	4.50	370	5.08	750	5.00	690	5.35	960
14	......	......	......	......	......	......	......	......	5.58	1,130	5.00	690	4.67	470	4.50	370	4.50	370	5.08	750	5.21	850	5.21	850
15	......	......	......	......	......	......	......	......	5.67	1,220	4.92	640	4.67	470	4.50	370	4.58	400	4.92	640	5.58	1,130	5.00	690
16	......	......	......	......	......	......	......	......	5.67	1,220	4.92	640	4.95	520	4.67	470	4.58	400	4.92	640	5.92	1,420	4.88	610
17	......	......	......	......	11.33	8,910	......	......	5.67	1,220	4.83	580	4.83	575	4.75	520	4.58	400	4.83	575	6.17	1,690	4.83	575
18	......	......	......	......	11.00	8,350	......	......	5.67	1,220	4.83	580	4.83	575	4.75	520	4.50	370	4.75	520	6.00	1,480	4.71	500
19	......	......	......	......	9.79	6,250	7.08	2,580	5.58	1,130	4.75	520	4.58	400	4.75	520	4.50	370	4.67	470	5.79	1,300	4.69	480
20	......	......	......	......	9.12	5,240	7.25	2,770	5.42	1,010	4.67	470	4.58	400	4.83	575	4.42	300	4.67	470	5.58	1,180	......	460
21	......	......	......	......	8.83	4,860	7.42	2,960	5.33	950	4.83	580	4.50	370	5.08	750	4.42	300	4.67	470	5.83	1,370	......	460
22	......	......	......	......	......	......	7.42	2,960	5.25	880	4.92	640	4.50	370	5.17	820	4.33	250	4.75	520	5.62	1,170	......	460
23	......	......	......	......	......	......	7.00	2,490	5.33	950	5.00	690	4.58	400	5.33	950	4.33	250	4.75	520	5.08	750	......	460
24	......	......	......	......	......	......	6.83	2,300	5.33	950	5.00	690	4.67	470	5.17	820	4.42	300	4.75	520	5.21	850	......	460
25	......	......	......	......	......	......	6.67	2,120	5.33	950	5.00	690	4.67	470	5.08	750	4.50	370	4.75	520	6.00	1,480	......	650
26	......	......	......	......	......	......	6.50	1,940	5.33	950	5.00	690	4.67	470	5.00	690	4.50	370	4.75	520	6.92	2,400	......	850
27	......	......	......	......	......	......	6.42	1,860	5.33	950	4.92	640	4.58	400	4.83	575	4.50	370	4.67	470	7.44	2,990	5.60	1,150
28	......	......	......	......	......	......	6.33	1,800	5.33	950	5.17	820	4.58	400	4.75	520	4.50	370	4.67	470	7.12	2,620	5.58	1,135
29	......	......	......	......	......	......	6.42	1,860	5.25	880	5.17	820	4.58	400	4.75	520	4.58	400	4.67	470	6.67	2,120	4.54	1,110
30	......	......	......	......	......	......	6.83	2,300	5.17	820	5.08	750	4.50	370	4.75	520	4.58	400	4.67	470	6.62	2,070	5.56	1,120
31	......	......	......	......	......	......	......	......	5.33	950	......	......	4.50	370	4.67	470	......	......	4.75	520	......	......	5.60	1,150

Monthly Discharge of Saugeen River near Port Elgin for 1914

Drainage Area, 1,565 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	2,490	820	1,320	1.59	.52	.84	.97
June	880	470	683	.56	.30	.44	.49
July	750	370	510	.48	.24	.33	.38
August	950	250	474	.61	.16	.30	.35
September	520	250	400	.33	.16	.26	.29
October	750	320	505	.48	.20	.32	.37
November	2,990	520	1,166	1.91	.33	.74	.82
December	1,890	460	1,020	1.21	.29	.65	.75
The period	2,490	250	760	1.59	.16	.49	4.42

NOTE—December records are approximate, as gauge readings from December 12th to 31st are unreliable due to ice damaging the gauge.

Saugeen River near Walkerton

Location—At the highway bridge, 3½ miles above the Town of Walkerton, Township of Brant, County of Bruce.

Records Available—Monthly discharge measurements, June, 1912, to July, 1914. Daily gauge heights, March 26 to Dec. 31, 1914.

Drainage Area—895 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and fastened to a post driven into the bed of the channel, and connected to a tree overhanging from the left shore, 100 feet upstream from the bridge. The zero on the gauge (elevation 12.00) is referred to a bench mark (elevation 31.46) painted B. M. on a large boulder, 308.6 feet to the right of the right abutment.

Channel—Straight for about 700 feet above and 500 feet below the station. Both banks are fairly high, clean and will not overflow, except at extreme stages. The bed of the stream is composed of clay, and one channel exists at all stages. The current is slow.

Discharge Measurements—Made from highway bridge with a large Price current meter.

Control—A dam is located in the Town of Walkerton, about 3½ miles below the station, but on account of the fall between the two points, it has no influence on the cross-section.

Winter Flow—The river is covered with ice during the winter months, and measurements are made through the ice to determine the winter discharge.

Accuracy—A well-defined rating curve has been established.

Observer—Henry Russwurm, Walkerton, Ont.

Discharge Measurements of Saugeen River near Walkerton in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 26....	Roberts. E	135	531	1.28	15.65	679	....
July 23....	"	....	548	1.34	15.80	734	....
Aug. 23....	"	....	572	1.41	16.00	805	....
Sept. 26....	"	....	572	1.42	16.00	812	....
Oct. 25....	"	....	572	1.42	16.00	814	....
Nov. 25....	"	....	699	2.14	17.00	1492	....
Dec. 21....	"	....	674	1.91	16.80	1287	....
1913							
Jan. 24....	"	....	1128	4.16	20.25	4691	....
Feb. 21....	"	135	732	2.34	17.25	1720	....
Mar. 22 (a)	"	....	1668	5.29	24.25	8836	....
April 22....	"	....	732	2.35	17.25	1724	....
May 20....	"	....	612	1.46	16.10	897	....
June 17....	Murray, W. S...	128	573	0.84	15.65	483	....
July 16....	"	135	491	0.59	15.20	294	....
Aug. 20....	"	135	449	0.55	15.00	251	....
Sept. 24....	"	135	483	0.79	15.20	347	....
Oct. 28....	"	135	509	1.11	15.70	563	....
Nov. 25....	"	135	716	1.70	17.00	1219	....
Dec. 29....	"	135	524	0.74	15.60	391	....
1914							
Jan. 26....	"	135	560	1.41	16.20	790	....
Feb. 23....	"	135	525	1.01	15.80	531	....
Mar. 20....	"	155	787	2.66	17.50	2098	....
April 27....	"	130	627	1.68	16.41	1056	....
May 26....	"	135	488	1.10	15.33	537	....
June 22....	"	130	440	0.81	15.08	357	....
July 27....	"	132	440	0.46	14.95	207	....

(a) Float measurement

Daily Gauge Height and Discharge of Saugeen River near Walkerton for 1914

Drainage Area, 895 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	.....	.....	.....	.....	.....	.....	23.00	7525	16.82	1360	15.25	388	15.00	267	14.92	230	15.00	267	14.92	230	15.17	350	17.17	1670
2	.....	.....	.....	.....	.....	.....	.....	.....	16.67	1230	15.08	307	15.25	388	14.92	230	15.00	267	14.92	230	15.17	350	17.08	1602
3	.....	.....	.....	.....	.....	.....	.....	.....	16.42	1060	15.17	350	15.08	307	14.92	230	15.08	307	14.92	230	15.25	388	17.00	1545
4	.....	.....	.....	.....	.....	.....	.....	.....	16.25	925	15.08	307	15.16	350	14.92	230	15.08	307	14.92	230	15.25	388	16.67	550
5	.....	.....	.....	.....	.....	.....	.....	.....	16.42	1060	15.00	267	15.08	307	14.92	230	15.08	307	14.92	230	15.17	350	16.50	1165
6	.....	.....	.....	.....	.....	.....	.....	.....	16.25	925	15.08	307	15.08	307	14.92	230	15.00	267	14.83	190	15.17	350	15.83	660
7	.....	.....	.....	.....	.....	.....	.....	.....	16.17	870	15.00	267	15.08	307	14.92	230	15.17	350	14.83	190	15.08	307	15.50	520
8	.....	.....	.....	.....	.....	.....	.....	.....	16.17	870	15.08	307	15.00	267	14.83	190	15.08	307	14.83	190	15.25	388	15.67	550
9	.....	.....	.....	.....	.....	.....	.....	.....	16.17	870	15.17	350	15.00	267	14.83	190	15.08	307	15.00	267	15.25	388	15.33	430
10	.....	.....	.....	.....	.....	.....	.....	.....	15.92	710	15.08	307	15.00	267	14.92	230	15.00	267	15.08	307	15.17	350	15.33	430
11	.....	.....	.....	.....	.....	.....	.....	.....	15.83	660	15.00	267	15.00	267	15.00	267	15.00	267	15.08	307	15.17	350	15.50	520
12	.....	.....	.....	.....	.....	.....	.....	.....	15.83	660	15.00	267	14.92	230	15.00	267	14.92	230	15.17	350	15.17	350	15.42	475
13	.....	.....	.....	.....	.....	.....	.....	.....	15.75	600	15.00	267	14.83	190	15.00	267	14.92	230	15.25	390	15.33	430	15.42	475
14	.....	.....	.....	.....	.....	.....	.....	.....	15.67	550	15.17	350	14.83	190	15.00	267	14.92	230	15.17	350	15.50	520	15.33	430
15	.....	.....	.....	.....	.....	.....	.....	.....	15.58	565	15.00	267	14.83	190	15.00	267	14.83	190	15.08	307	15.50	520	15.33	430
16	.....	.....	.....	.....	.....	.....	.....	.....	15.42	475	15.00	267	15.00	267	15.00	267	14.83	190	15.08	307	15.92	710	15.33	430
17	.....	.....	.....	.....	.....	.....	17.16	1620	15.42	475	15.00	267	15.08	307	15.00	267	14.83	190	15.08	307	16.33	1040	15.50	520
18	.....	.....	.....	.....	.....	.....	17.16	1620	15.42	475	15.00	267	15.08	307	15.08	307	14.75	155	15.17	350	16.17	870	15.75	600
19	.....	.....	.....	.....	.....	.....	17.33	1780	15.33	430	15.08	307	14.92	230	15.08	307	14.67	120	15.17	350	15.92	710	15.75	600
20	.....	.....	.....	.....	.....	.....	17.58	1950	15.25	388	15.17	350	15.00	267	15.08	307	14.50	50	15.17	350	15.92	710	15.75	600
21	.....	.....	.....	.....	.....	.....	17.67	2050	15.25	388	15.08	307	15.08	307	15.58	565	14.83	190	15.08	307	15.67	550	15.75	600
22	.....	.....	.....	.....	.....	.....	17.33	1780	15.25	388	15.17	350	15.08	307	15.42	475	14.83	190	15.00	267	15.50	520	15.75	600
23	.....	.....	.....	.....	.....	.....	17.00	1550	15.25	388	15.08	307	15.08	307	15.33	430	14.83	190	15.00	267	15.50	520	15.67	550
24	.....	.....	.....	.....	.....	.....	16.83	1370	15.25	388	15.08	307	15.00	267	15.33	430	14.92	230	15.08	307	15.42	475	15.42	475
25	.....	.....	.....	.....	.....	.....	16.58	1180	15.25	388	15.08	307	15.00	267	15.17	350	14.92	230	15.08	307	15.75	600	15.42	475
26	.....	.....	.....	.....	18.00	2400	16.42	1060	15.33	430	15.08	307	14.92	230	15.00	267	14.75	155	15.08	307	16.00	810	15.42	475
27	.....	.....	.....	.....	19.75	4175	16.42	1060	15.25	388	15.00	267	14.83	190	15.00	267	14.50	50	15.00	267	16.50	1165	15.58	565
28	.....	.....	.....	.....	21.50	6000	16.50	1110	15.25	388	15.08	307	15.00	267	15.00	267	14.75	155	15.08	307	16.42	1060	15.58	565
29	.....	.....	.....	.....	22.29	6800	16.67	1240	15.17	350	15.17	350	14.92	230	14.92	230	14.83	190	15.17	350	16.42	1060	15.75	600
30	.....	.....	.....	.....	22.83	7360	17.60	1480	15.25	388	15.17	350	14.92	230	14.83	190	14.92	230	15.17	350	16.67	1240	15.75	600
31	.....	.....	.....	.....	23.87	8450	.....	.....	15.33	430	.....	.....	14.92	230	15.00	267			15.17	350			15.67	550

Monthly Discharge of Saugeen River near Walkerton for 1914

Drainage Area, 895 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	1,360	350	628	1.52	.39	.70	.81
June	388	267	306	.43	.30	.34	.38
July	388	190	268	.43	.21	.29	.33
August	565	190	282	.56	.21	.31	.37
September	350	50	220	.39	.06	.24	.27
October	390	190	292	.43	.21	.32	.37
November	1,240	307	594	1.39	.34	.66	.73
December	1,670	430	653	1.87	.48	.73	.84
The period	1,670	50	406	1.87	.06	.44	4.10

Teeswater River at Paisley

Location—At the main highway bridge, in the Village of Paisley, 200 feet above the confluence of the Saugeen with Teeswater River, Township of Elderslie, County of Bruce.

Records Available—Monthly discharge measurements, Oct., 1912, to July, 1914.

Drainage Area—227 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and attached to a post in the tail race of Fisher's Mill at the bridge. The zero on the gauge (elevation 16.00) is referred to a bench mark (elevation 28.30) painted on top of concrete wall of the Grist Mill flume line, on the right bank, 150 feet from the bridge. Another bench mark (elevation 40.65) is painted on the step of the woolen mill on the right bank, 14 feet below the bridge.

Channel—Straight for about 700 feet above and 200 feet below the station, where the stream joins with the Saugeen River. The banks are high, sodded, and will not overflow. The bed of the river is composed of clay and gravel, slightly shifting. The current is fast, and flows through one channel.

Discharge Measurements—Made from the highway bridge with a large Price current meter.

Control—The intermittent operations of a mill 300 feet above the station causes fluctuations at the gauge.

Winter Flow—During the winter months the river is partly covered with ice, and measurements are made to determine the winter discharge. The relation of gauge height to discharge is affected by ice.

Discharge Measurements of Teeswater River at Paisley in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Oct. 26....	Roberts, F	....	160	1.55	18.00	248	1.93
Nov. 26....	"	....	314	2.11	18.93	662	2.92
Dec. 21....	"	....	269	2.47	18.93	665	2.93
1913							
Jan. 24....	"	117	641	2.82	22.30	1813	7.99
Feb. 22....	"	117	342	2.56	19.70	866	3.82
Mar. 24....	"	117	994	3.40	25.60	3380	14.89
April 22....	"	117	298	2.21	18.90	661	2.92
May 20....	"	117	203	1.30	17.90	266	1.17
June 17 (a)	Murray, W. S..	117	75	1.12	17.10	84	0.37
July 16.....	"	117	106	1.83	17.30	194	0.85
Aug. 20 (b)	"	105	65	0.44	16.80	29	0.13
Sept. 24....	"	107	71	1.81	16.80	137	0.60
Oct. 28....	"	109	138	1.92	17.50	266	1.17
Nov. 25....	"	112	315	1.87	19.00	590	2.60
Dec. 30....	"	....	138	1.10	17.50	252	1.11
1914							
Jan. 27....	"	110	171	1.86	18.20	442	1.95
Feb. 24....	"	110	120	1.87	17.60	238	1.05
Mar. 26....	"	110	418	1.84	20.20	771	3.40
April 28....	"	110	214	1.25	18.30	270	1.19
May 27....	"	110	129	1.24	17.16	161	0.71
June 23....	"	105	68	0.32	16.66	22	0.10
July 28....	"	103	46	0.34	16.33	16	0.07

(a) Backwater from Saugeen River
(b) Mill not running

Credit River at Cataract Junction

Location—About 500 feet opposite the C. P. Ry. station at Cataract Jct., Township of Caledon, County of Peel.

Records Available—Monthly discharge measurements, June, 1912, to Nov., 1914.

Drainage Area—91 square miles.

Gauge—A bench mark gauge (elev. 10.00) painted on the side of a rock in the centre of the river at the section, from which measurements are taken to the surface of the water, by means of a graduated staff.

Channel—Straight for about 150 feet above and 100 feet below the station. The right bank is low, sodded, and liable to overflow, but the left bank is very high and composed of gravel. The bed consists of gravel and rocks, slightly shifting. The current is swift, flowing through one channel at all stages.

Discharge Measurements—Made by wading with a Price current meter.

Control—A dam ½ mile below the station, operated by the Deagle Power Plant at Cataract Falls, does not affect the section on account of the heavy fall in the river bed between the two points.

Winter Flow—The river remains open at the station as well as in a number of other places during the winter months.

Discharge Measurements of Credit River at Cataract Junction in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 24....	Roberts, E.	....	38	1.38	10.15	52	.57
July 22....	"	....	42	1.59	10.30	67	.73
Aug. 29 (a)	"	....	43	1.77	10.30	76	.84
Sept. 30....	"	....	51	1.92	10.50	98	1.07
Oct. 31....	"	....	47	1.91	10.40	90	.99
Nov. 23....	"	....	51	1.90	10.50	97	1.06
Dec. 30....	"	....	48	1.79	10.40	86	.94
1913							
Jan. 30....	"	....	87	2.30	11.10	200	2.19
Feb. 28....	"	....	47	1.79	10.04	84	.92
Mar. 29....	"	....	110	2.09	11.50	230	2.52
Apr. 30....	"	....	67	2.55	10.80	171	1.87
May 26....	Murray, W. S...	....	57	1.89	10.60	108	1.18
June 25....	"	....	37	1.41	10.20	53	.58
July 25....	"	....	34	1.25	10.10	41	.45
Aug. 31....	"	....	34	1.02	10.10	35	.38
Oct. 3....	"	....	37	1.10	10.20	42	.46
Nov. 6 (b)	"	....	41	0.94	10.30	39	.43
Dec. 3 (b)	"	....	48	0.77	10.50	37	.40
Dec. 31 (b)	"	....	60	1.51	10.70	91	.99
1914							
Feb. 3 (b)	"	....	155	1.64	13.60	256	2.80
Mar. 4 (b)	"	....	46	1.45	10.80	68	.74
Apr. 24 (c)	"	....	112	0.49	8.80	55	.60
May 22....	"	....	38	0.76	8.58	29	.32
July 3....	"	45	31	0.90	8.50	28	.31
July 31....	"	45	33	0.96	8.60	32	.35
Aug. 28....	"	44	28	0.60	8.50	17	.19
Oct. 2....	"	44	29	0.80	8.50	24	.26
Nov. 1....	"	45	31	1.09	8.55	34	.37

(a) Water rose during time of measurement
(b) Backwater due to construction of dam
(c) New section established

Nottawasaga River near Nicolston

Location.—At the highway bridge known at McLean's Bridge, 4 miles north of the Town of Nicolston, Township of Essa, County of Simcoe.

Records Available.—Monthly discharge measurements, June, 1912, to Oct., 1914. Daily gauge heights, Aug. 18 to Dec. 31, 1914.

Drainage Area.—325 square miles.

Gauge.—Vertical steel staff with enamelled face, graduated in feet and inches, and fastened on the upstream side of the right abutment. The zero of the gauge (elevation 4.17) is referred to a bench mark (elevation 23.51) painted on a square tree stump on the left bank, 250 feet to the left of the upstream side of the abutment.

Channel.—Straight for about 500 feet below the station. Commencing at a point about 200 feet above the section the river curves continuously to the left until it reaches the station, where the river makes an angle of about 68 degrees with the cross-section. Both banks consist of clay and sand, fairly high, wooded, and not liable to overflow. The bed of the stream is composed of clay and sand. The current is fairly fast.

Discharge Measurements.—Made at the highway bridge with a large Price current meter.

Control.—A mill dam, located 2½ miles upstream, affects the gauge heights due to the intermittent operation of the mill.

Winter Flow.—The river is covered with ice during the winter months, and measurements are made through the ice to determine the winter discharge.

Accuracy.—The angle which the current makes at the gauging station necessitates a correction. A well-defined rating curve has been established.

Observer.—John Scott, Egbert P.O., Ontario.

Discharge Measurements of Nottawasaga River near Nicolston in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 11....	Roberts, E	....	347	1.23	7.00	425	....
July 6....	"	....	235	0.84	5.60	197	....
Aug. 9....	"	....	233	0.82	5.60	190	....
Sept. 13....	"	....	240	0.65	5.54	156	....
Oct. 13....	"	....	311	0.84	6.42	260	....
Nov. 15....	"	....	721	2.19	11.02	1,580	....
Dec. 13....	"	....	337	1.04	6.72	352	....
1913							
Jan. 15....	"	85	361	1.33	7.02	481	....
Feb. 13....	"	85	278	0.86	6.02	241	....
Mar. 16....	"	90	1,260	1.91	17.02	2416	....
April 12....	"	90	620	1.61	10.02	1261	....
May 10....	"	85	294	1.20	6.22	355	....
June 11....	Murray, W. S...	80	253	0.88	5.70	223	....
July 9....	"	85	238	0.58	5.50	139	....
Aug. 13....	"	85	222	0.34	5.30	89	....
Sept. 12	"	85	238	0.54	5.50	131	....
Oct. 22....	"	85	281	0.75	6.00	209	....
Nov. 20....	"	85	418	1.21	7.60	506	....
Dec. 15....	"	85	333	1.04	6.70	346	....
1914							
Jan 16 (a)	"	85	246	0.52	5.50	129	....
Feb. 15 (a	"	85	318	1.03	6.50	328	....
Mar. 14 (a)	"	85	357	1.03	6.60	367	....
April 8....	"	85	434	1.58	7.75	688	....
May 14....	"	85	372	0.97	6.67	361	....
June 18....	"	85	230	0.57	5.00	130	....
July 16....	"	85	238	0.64	5.50	154	....
Aug. 18....	"	85	260	0.63	5.38	165	....
Oct. 13....	"	85	293	0.83	6.25	241	....

(a) Ice measurement

Daily Gauge Height and Discharge of Nottawasaga River near Nicolston for 1914

Drainage Area, 325 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1																	5.59	132	5.63	137	5.92	178	6.63	292
2																	6.59	285	5.25	88	6.05	199	6.98	352
3																	6.25	230	5.30	94	6.00	190	7.13	382
4																	5.84	166	5.25	88	5.98	187	6.88	335
5																	5.71	147	5.51	121	6.09	204	6.46	263
6																	5.63	137	5.55	127	6.05	199	6.13	210
7																	5.59	132	5.67	140	6.09	204	6.09	204
8																	5.63	137	5.67	140	6.00	190	5.86	169
9																	5.63	137	5.88	171	6.13	210	6.21	222
10																	5.55	127	6.13	210	5.94	180	6.09	204
11																	5.44	111	6.75	312	6.09	204	5.98	187
12																	5.61	133	6.13	210	6.05	199	6.05	199
13																	5.34	99	6.25	230	6.40	252	5.82	178
14																	5.50	120	5.88	171	6.88	335	6.05	199
15																	5.48	117	5.75	153	6.50	269	5.92	178
16																	5.42	109	5.92	178	7.23	403	6.03	210
17																	5.40	106	6.00	190	7.50	465	5.84	166
18															5.55	127	5.38	103	6.42	255	6.46	263	5.88	171
19															5.57	130	5.25	88	6.23	226	6.67	300	6.00	190
20															5.59	132	5.30	94	6.17	215	6.09	204	5.63	137
21															5.79	159	5.25	88	6.00	190	5.84	166	6.00	190
22															6.13	210	5.42	109	5.96	183	5.92	178	5.84	166
23															5.75	153	5.42	109	5.96	183	6.34	243	6.09	204
24															5.54	125	5.57	130	5.92	178	6.09	204	5.88	171
25															5.50	120	5.59	132	5.84	166	6.05	213	5.75	153
26															5.25	88	5.38	103	5.96	183	6.38	250	6.34	243
27															5.38	103	5.38	103	5.92	178	6.61	288	5.84	166
28															5.50	120	5.42	109	5.84	166	7.09	374	5.96	183
29															5.34	99	5.63	137	5.86	169	6.17	215	6.21	222
30															5.59	132	5.55	127	6.00	190	6.67	300	6.09	204
31															5.80	161			6.05	199			6.09	204

Monthly Discharge of Nottawasaga River near Nicolston for 1914

Drainage Area 325 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	285	88	129	.88	.27	.397	.45
October	312	88	176	.96	.27	.542	.62
November	465	166	242	1.43	.51	.745	.82
December	382	137	211	1.18	.42	.649	.75
The period	465	88	189	1.43	.27	.582	2.64

Beaver River near Kimberley

Location.—At the concrete highway bridge known as Weber's Bridge, 2 miles south-east of Kimberley, Township of Euphrasia, County of Grey.

Records Available.—Monthly discharge measurements, Sept. to Dec., 1914. Gauge heights read at the tailwater gauge of the Eugenia Falls Power Plant, about 2 miles above the station.

Drainage Area.—105 square miles.

Gauge.—A bench mark gauge (elevation 10.00) painted on the top of right abutment, on the downstream side. Measurements are made to the surface of the water by means of a graduated staff. A staff gauge will be installed in January, 1915, and a gauge recorder employed.

Channel.—Straight for about 500 feet above and 100 feet below the station. The banks are low, wooded, and liable to overflow at high stages. The bed of the stream is composed of sand and gravel, and is shifting. The current is moderate and flows through two channels, which join about 5 miles below the station.

Discharge Measurements.—Made from the bridge with a large Price current meter.

Winter Flow.—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge.

Accuracy.—The few measurements that have been taken at low flows since establishment of the station give a well-defined rating curve.

Discharge Measurements of Beaver River near Kimberley in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Sept. 3....	Murray, W. S..	34.5	38	1.45	4.15	55	.53
" 24....	"	34.5	36	1.34	4.10	48	.46
Oct. 21....	"	34.0	38	1.55	4.20	61	.59
Nov. 5....	"	34.0	52	1.63	4.40	85	.81

Discharge Measurements of Beaver River near Thornbury and Clarksburg (a) in 1912-3

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Aug........	Roberts, E	....	69	3.39	....	234	1.02
Sept........	"	....	64	3.37	....	216	.94
Oct	"	....	66	3.40	....	225	.98
Nov........	"	....	174	5.55	....	966	4.22
Dec..........	"	....	125	5.23	....	404	1.76
1913							
Jan	"	....	151	5.34	....	807	3.53
Feb. 27....	"	....	157	3.10	....	487	2.12
Mar. 31....	"	....	534	5.91	....	3160	13.80
April 29....	"	....	280	3.11	....	873	3.81
May 27....	"	65	165	2.00	....	346	1.51
June 27....	Murray, W. S...	38	41	4.10	....	171	.75
July 29....	"	40	26	3.68	5.40	94	.41
Aug. 31....	"	36	20	3.83	5.30	78	.34
Oct. 13....	"	38	52	1.34	5.60	69	.30
Nov. 10....	"	68	69	1.73	6.60	120	.52
Dec. 5....	"	80	156	2.36	6.70	368	1.61
1914							
Jan. 6....	"	90	259	1.63	5.80	433	1.89
Feb. 5....	"	80	259	1.66	7.20	429	1.87
Mar. 6....	"	80	244	1.51	6.70	370	1.61
Mar. 31....	"	80	411	4.93	9.00	2030	8.86
May 5....	"	80	275	1.72	7.67	537	2.34
June 2....	"	80	225	0.73	6.71	166	.72
July 6....	"	37	48	2.18	6.25	105	.46

(a) This station discontinued on account of backwater caused by dam at Thornbury.

Daily Gauge Height and Discharge of Beaver River at Eugenia for 1910

Drainage Area 74 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......	......	45	......	34	......	28	......	23	......	38	......	40
2	......	......	......	......	......	......	......	......	......	......	......	......	......	43	......	41	......	24	......	23	......	56	......	39
3	......	......	......	......	......	......	......	......	......	......	......	......	......	42	......	33	......	26	......	24	......	52	......	42
4	......	......	......	......	......	......	......	......	......	......	......	......	......	40	......	38	......	27	......	29	......	49	......	42
5	......	......	......	......	......	......	......	......	......	......	......	......	......	40	......	41	......	30	......	30	......	44	......	35
6	......	......	......	......	......	......	......	......	......	......	......	......	......	41	......	35	......	38	......	40	......	42	......	36
7	......	......	......	......	......	......	......	......	......	......	......	......	......	41	......	34	......	36	......	39	......	39	......	29
8	......	......	......	......	......	......	......	......	......	......	......	......	......	40	......	34	......	32	......	38	......	39	......	32
9	......	......	......	......	......	......	......	......	......	......	......	......	......	39	......	41	......	31	......	35	......	39	......	36
10	......	......	......	......	......	......	......	......	......	......	......	......	......	38	......	47	......	29	......	35	......	45	......	36
11	......	......	......	......	......	......	......	......	......	......	......	......	......	41	......	50	......	28	......	30	......	47	......	35
12	......	......	......	......	......	......	......	......	......	......	......	......	......	44	......	35	......	27	......	30	......	60	......	36
13	......	......	......	......	......	......	......	......	......	......	......	......	......	54	......	38	......	29	......	28	......	42	......	32
14	......	......	......	......	......	......	......	......	......	......	......	73	......	45	......	34	......	30	......	28	......	41	......	28
15	......	......	......	......	......	......	......	......	......	......	......	68	......	39	......	33	......	29	......	28	......	37	......	27
16	......	......	......	......	......	......	......	......	......	......	......	63	......	55	......	31	......	23	......	27	......	37	......	27
17	......	......	......	......	......	......	......	......	......	......	......	59	......	57	......	31	......	26	......	27	......	35	......	00
18	......	......	......	......	......	......	......	......	......	......	......	57	......	47	......	32	......	26	......	27	......	42	......	36
19	......	......	......	......	......	......	......	......	......	......	......	55	......	42	......	34	......	27	......	27	......	47	......	30
20	......	......	......	......	......	......	......	......	......	......	......	52	......	41	......	34	......	26	......	28	......	45	......	38
21	......	......	......	......	......	......	......	......	......	......	......	50	......	42	......	30	......	26	......	28	......	34	......	35
22	......	......	......	......	......	......	......	......	......	......	......	47	......	38	......	31	......	29	......	30	......	46	......	38
23	......	......	......	......	......	......	......	......	......	......	......	49	......	37	......	31	......	25	......	30	......	46	......	34
24	......	......	......	......	......	......	......	......	......	......	......	51	......	36	......	31	......	27	......	30	......	44	......	36
25	......	......	......	......	......	......	......	......	......	......	......	49	......	37	......	31	......	27	......	29	......	44	......	38
26	......	......	......	......	......	......	......	......	......	......	......	46	......	36	......	35	......	26	......	28	......	46	......	39
27	......	......	......	......	......	......	......	......	......	......	......	48	......	36	......	34	......	29	......	40	......	43	......	39
28	......	......	......	......	......	......	......	......	......	......	......	48	......	37	......	30	......	27	......	42	......	39	......	35
29	......	......	......	......	......	......	......	......	......	......	......	47	......	37	......	29	......	26	......	47	......	42	......	31
30	......	......	......	......	......	......	......	......	......	......	......	46	......	36	......	29	......	26	......	35	......	44	......	29
31	......	......	......	......	......	......	......	......	......	......	......	......	......	38	......	28	......	......	......	35	......	......	......	35

Daily Gauge Height and Discharge of Beaver River at Eugenia for 1911

Drainage Area, 74 Square Miles

Day	January Gauge Ht. Feet	January Discharge Sec-ft.	February Gauge Ht. Feet	February Discharge Sec-ft.	March Gauge Ht. Feet	March Discharge Sec-ft.	April Gauge Ht. Feet	April Discharge Sec-ft.	May Gauge Ht. Feet	May Discharge Sec-ft.	June Gauge Ht. Feet	June Discharge Sec-ft.
1	......	35	......	50	......	54	......	160	......	161	......	53
2	......	39	......	49	......	50	......	153	......	165	......	53
3	......	40	......	49	......	48	......	151	......	157	......	51
4	......	42	......	48	......	51	......	161	......	144	......	49
5	......	42	......	50	......	51	......	199	......	132	......	50
6	......	41	......	42	......	48	......	205	......	123	......	50
7	......	41	......	43	......	49	......	215	......	116	......	48
8	......	42	......	45	......	43	......	215	......	111	......	47
9	......	38	......	45	......	47	......	217	......	103	......	46
10	......	42	......	47	......	53	......	232	......	97	......	45
11	......	42	......	46	......	54	......	258	......	93	......	60
12	......	43	......	47	......	63	......	302	......	89	......	63
13	......	44	......	44	......	66	......	346	......	83	......	66
14	......	44	......	47	......	81	......	430	......	80	......	65
15	......	45	......	46	......	78	......	529	......	76	......	57
16	......	42	......	45	......	71	......	469	......	78	......	52
17	......	42	......	50	......	88	......	367	......	87	......	49
18	......	41	......	51	......	78	......	319	......	89	......	45
19	......	42	......	52	......	73	......	292	......	86	......	43
20	......	42	......	53	......	72	......	282	......	75	......	39
21	......	43	......	54	......	70	......	267	......	74	......	37
22	......	42	......	48	......	73	......	250	......	70	......	37
23	......	38	......	50	......	87	......	234	......	72	......	36
24	......	45	......	50	......	73	......	217	......	72	......	36
25	......	45	......	52	......	86	......	200	......	67	......	35
26	......	47	......	53	......	97	......	190	......	66	......	35
27	......	48	......	53	......	137	......	181	......	61	......	40
28	......	49	......	50	......	178	......	173	......	59	......	36
29	......	51	......	......	......	190	......	168	......	56	......	34
30	......	48	......	......	......	181	......	160	......	52	......	32
31	......	48	......	......	......	174	......	......	......	53	......	......

Day	July Gauge Ht. Feet	July Discharge Sec-ft.	August Gauge Ht. Feet	August Discharge Sec-ft.	September Gauge Ht. Feet	September Discharge Sec-ft.	October Gauge Ht. Feet	October Discharge Sec-ft.	November Gauge Ht. Feet	November Discharge Sec-ft.	December Gauge Ht. Feet	December Discharge Sec-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......
2	......	......	......	......	......	......	......	......	......	......	......	......
3	......	......	......	......	......	......	......	......	......	......	......	......
4	......	......	......	......	......	......	......	......	......	......	......	......
5	......	......	......	......	......	......	......	......	......	......	......	......
6	......	......	......	......	......	......	......	......	......	......	......	......
7	......	......	......	......	......	......	......	......	......	......	......	......
8	......	......	......	......	......	......	......	......	......	......	......	......
9	......	......	......	......	......	......	......	......	......	......	......	......
10	......	......	......	......	......	......	......	......	......	......	......	......
11	......	......	......	......	......	......	......	......	......	......	......	......
12	......	......	......	......	......	......	......	......	......	......	......	......
13	......	......	......	......	......	......	......	......	......	......	......	......
14	......	......	......	......	......	......	......	......	......	......	......	......
15	......	......	......	......	......	......	......	......	......	......	......	......
16	......	......	......	......	......	......	......	......	......	......	......	......
17	......	......	......	......	......	......	......	......	......	......	......	......
18	......	......	......	......	......	......	......	......	......	......	......	......
19	......	......	......	......	......	......	......	......	......	......	......	......
20	......	......	......	......	......	......	......	......	......	......	......	......
21	......	......	......	......	......	......	......	......	......	......	......	......
22	......	......	......	......	......	......	......	......	......	......	......	......
23	......	......	......	......	......	......	......	......	......	......	......	......
24	......	......	......	......	......	......	......	......	......	......	......	......
25	......	......	......	......	......	......	......	......	......	......	......	......
26	......	......	......	......	......	......	......	......	......	......	......	......
27	......	......	......	......	......	......	......	......	......	......	......	......
28	......	......	......	......	......	......	......	......	......	......	......	......
29	......	......	......	......	......	......	......	......	......	......	......	......
30	......	......	......	......	......	......	......	......	......	......	......	......
31	......	......	......	......	......	......	......	......	......	......	......	......

Daily Gauge Height and Discharge of Beaver River at Eugenia for 1913

Drainage Area, 74 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	.....	......	.....	......	.....	......	.....	......	.....	2.605	72	2.435	51	2,305	36	2.255	30	2.25	30	2.26	31	2.395	46
2	......	.....	......	.....	......	.....	......	.....	......	.....	2.595	71	2.420	49	2.295	35	2.255	30	2.21	27	2.255	30	2.43	50
3	......	.....	......	.....	......	.....	......	.....	......	.....	2.585	70	2.415	48	2.290	34	2.255	30	2.22	27	2.25	30	2.44	52
4	......	.....	......	.....	......	.....	......	.....	......	.....	2.575	69	2.430	50	2.295	35	2.245	29	2.225	27	2.29	34	2.39	45
5	......	.....	......	.....	......	.....	......	.....	......	.....	2.565	67	2.480	57	2.295	35	2.240	29	2.22	27	2.285	34	2.385	45
6	......	.....	......	.....	......	.....	......	.....	......	.....	2.625	75	2.475	55	2.265	32	2.240	29	2.215	27	2.27	38	2.365	43
7	......	.....	......	.....	......	.....	......	.....	......	.....	2.790	99	2.420	49	2.275	33	2.235	28	2.235	28	2.255	30	2.35	41
8	......	.....	......	.....	......	.....	......	.....	......	.....	2.765	95	2.400	46	2.245	30	2.250	30	2.215	27	2.26	31	2.39	45
9	......	.....	......	.....	......	.....	......	.....	......	.....	2.685	83	2.395	46	2.285	34	2.245	29	2.21	27	2.28	33	2.335	39
10	......	.....	......	.....	......	.....	......	.....	......	.....	2.630	76	2.395	46	2.295	35	2.235	28	2.21	27	2.30	35	2.34	40
11	......	.....	......	.....	......	.....	......	.....	......	.....	2.605	72	2.380	44	2.300	35	2.225	28	2.22	27	2.295	35	2.33	39
12	......	.....	......	.....	......	.....	......	.....	......	.....	2.580	69	2.405	47	2.285	34	2.225	28	2.23	28	2.29	34	2.34	40
13	......	.....	......	.....	......	.....	......	.....	......	.....	2.570	68	2.415	48	2.275	33	2.220	27	2.21	27	2.295	35	2.34	40
14	......	.....	......	.....	......	.....	......	.....	......	.....	2.545	64	2.400	46	2.270	32	2.220	27	2.22	27	2.315	36	2.35	41
15	......	.....	......	.....	......	.....	......	.....	1.02	100	2.540	64	2.375	44	2.270	32	2.215	27	2.21	27	2.315	36	2.355	41
16	......	.....	......	.....	......	.....	......	.....	1.03	105	2.535	62	2.365	43	2.260	31	2.225	28	2.215	27	2.305	36	2.355	41
17	......	.....	......	.....	......	.....	......	.....	1.02	105	2.525	62	2.360	42	2.265	31	2.230	28	2.21	27	2.285	34	2.34	40
18	......	.....	......	.....	......	.....	......	.....	1.015	105	2.515	61	2.360	42	2.260	31	2.260	31	2.23	28	2.305	36	2.34	40
19	......	.....	......	.....	......	.....	......	.....	1.01	105	2.535	63	2.355	41	2.245	29	2.245	29	2.26	31	2.465	55	2.34	40
20	......	.....	......	.....	......	.....	......	.....	.97	90	2.535	63	2.350	41	2.240	29	2.225	28	2.22	27	2.74	88	2.345	40
21	......	.....	......	.....	......	.....	......	.....	.965	90	2.545	64	2.340	40	2.230	29	2.260	31	2.225	27	2.68	83	2.32	38
22	......	.....	......	.....	......	.....	......	.....	.995	95	2.520	61	2.335	39	2.265	31	2.240	29	2.265	31	2.61	73	2.31	36
23	......	.....	......	.....	......	.....	......	.....	.995	95	2.495	58	2.330	39	3.300	35	2.245	29	2.255	30	2.57	68	2.325	38
24	......	.....	......	.....	......	.....	......	.....	.98	92	2.470	55	2.330	39	2.295	35	2.230	28	2.38	44	2.525	62	2.31	36
25	......	.....	......	.....	......	.....	......	.....	.955	90	2.465	55	2.325	38	2.265	31	2.225	27	2.38	44	2.495	58	2.315	36
26	......	.....	......	.....	......	.....	......	.....	.98	95	2.490	58	2.320	38	2.265	31	2.225	27	2.32	38	2.46	55	2.22	27
27	......	.....	......	.....	......	.....	......	.....	.93	90	2.490	58	2.310	36	2.265	31	2.240	29	2.28	33	2.425	50	2.23	28
28	......	.....	......	.....	......	.....	......	.....	.915	85	2.470	55	2.315	36	2.255	30	2.230	28	2.295	35	2.395	46	2.29	34
29	......	.....	......	.....	......	.....	......	.....	.905	81	2.445	52	2.310	37	2.275	33	2.205	25	2.295	35	2.375	44	2.28	33
31	......	.....	......	.....	......	.....	......	.....	.90	77	2.430	50	2.315	36	2.295	35	2.235	28	2.29	34	2.395	46	2.315	36
30	......	.....	......	.....	......	.....	......	.....	2.62	*72	......	.....	2.295	35	2.280	33	......	.....	2.23	28	......	.....	2.28	33

* Weir changed to 30.89 feet.

Daily Gauge Height and Discharge of Beaver River at Eugenia for 1914

Drainage Area, 74 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	2.30	35	3.59	72	3.115	46	3.62	255	3.00	133	2.57	68
2	2.295	35	3.58	71	3.065	43	3.69	270	3.00	133	2.58	69
3	2.30	35	......	69	3.08	44	3.70	273	2.95	125	2.545	64
4	2.31	36	......	67	3.09	45	3.63	257	2.90	118	2.52	62
5	2.30	35	3.43*	64	3.10	45	3.42	215	2.875	113	2.48	57
6	2.26	31	3.38	61	3.11	46	3.285	187	2.86	111	2.47	55
7	2.27	32	3.475	67	3.11	46	3.215	175	2.84	108	2.46	53
8	2.275	33	3.44	64	3.11	46	3.215	175	2.80	101	2.46	53
9	2.27	32	3.395	62	3.09	45	3.165	165	2.79	100	2.45	52
10	2.84§	31	3.375	61	3.105	45	3.08	150	2.76	95	2.435	50
11	2.835	31	3.295	56	3.04	42	3.08	150	2.735	91	2.43	50
12	2.80	30	3.245	53	3.01	45	3.04	142	2.71	87	2.42	48
13	2.76	28	3.205	51	3.04	42	2.99	136	2.70	86	2.42	48
14	2.725	26	3.205	51	3.08	44	3.015	137	2.69	85	2.405	47
15	2.74	27	3.20	51	3.12	46	3.08	150	2.65	79	2.40	47
16	2.795	27	3.20	51	3.14	48	3.185	168	2.65	79	2.40	48
17	2.82	30	3.20	51	3.45	65	3.245	180	2.62	75	2.40	47
18	2.83	31	3.205	51	3.525	69	3.31	193	2.61	73	2.395	46
19	2.825	31	3.20	51	3.385	61	3.37	205	2.61	73	2.42	48
20	2.82	30	3.19	50	3.29	56	3.48	227	2.61	73	2.42	48
21	2.80	29	3.195	51	3.43	64	3.38	207	2.60	71	2.41	47
22	2.795	29	3.165	48	3.41	63	3.215	185	2.60	71	2.42	48
23	2.81	30	2.975	39	3.375	61	3.00	135	2.60	71	2.42	48
24	2.90	34	3.115	46	3.33	58	3.115	160	2.58	69	2.40	46
25	2.92	35	3.02	41	3.335	58	3.02	138	2.59	70	2.40	46
26	2.89	33	3.005	40	3.60 3.27†	75 175	3.00	133	2.58	69	2.39	45
27	3.005	39	3.075	44	2.955	127	2.98	131	2.57	68	2.39	45
28	3.085	43	3.145	45	3.10	152	2.86	110	2.56	67	2.32	44
29	3.23	51	......	.....	3.14	160	3.01	136	2.58	62	2.32	44
30	3.48	65	......	.....	3.33	196	3.02	138	2.52	62	2.37	43
31	3.555	69	......	.....	3.49	228	......	.....	2.55	65	......	.....

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft
1	2.41	48	2.22	28	2.23	29	2.23	29	2.345	42	2.54	64
2	2.38	44	2.21	27	2.23	29	2.165	23	2.335	41	2.59	71
3	2.36	42	2.22	28	2.23	29	2.15	22	2.345	42	2.565	68
4	2.37	43	2.22	28	2.22	28	2.15	22	2.31	37	2.52	62
5	2.32	37	2.215	27	2.21	27	2.11	18	2.28	34	2.475	57
6	2.32	37	2.205	26	2.22	28	2.21	27	2.29	35	2.43	51
7	2.32	37	2.205	26	2.22	28	2.165	23	2.22	28	2.435	51
8	2.30	35	2.19	25	2.21	27	2.15	22	2.20	26	2.42	50
9	2.30	35	2.21	27	2.20	26	2.28	34	2.215	27	2.275	33
10	2.30	35	2.21	27	2.195	25	2.315	38	2.23	29	2.31	37
11	2.30	‡35	2.21	27	2.21	27	2.365	44	2.21	27	2.355	42
12	2.30	36	2.20	26	2.18	24	2.325	39	2.23	29	2.355	42
13	2.29	35	2.21	27	2.20	26	2.285	35	2.31	37	2.315	37
14	2.29	35	2.29	35	3.19	25	2.255	32	2.23	29	2.29	35
15	2.28	34	2.24	30	2.19	25	2.22	28	2.315	38	2.28	34
16	2.28	34	2.23	29	2.24	30	2.20	26	2.47	56	2.29	35
17	2.28	34	2.25	31	2.20	26	2.235	30	2.495	59	2.30	36
18	2.28	34	2.30	36	2.19	25	2.215	28	2.445	53	2.30	36
19	2.27	33	2.36	43	2.19	25	2.23	29	2.39	46	2.30	36
20	2.27	33	2.39	46	2.18	24	2.255	32	2.355	43	2.31	37
21	2.265	32	2.38	45	2.17	23	2.24	30	2.35	42	2.30	36
22	2.25	31	2.36	43	2.19	25	2.22	28	2.34	40	2.295	35
23	2.255	31	2.36	40	2.19	25	2.205	27	2.29	35	2.27	33
24	2.30	36	2.29	35	2.19	25	2.20	26	2.325	39	2.29	35
25	2.30	36	2.24	30	2.18	24	2.235	30	2.33	39	2.29	35
26	2.28	34	2.22	28	2.17	23	2.24	30	2.365	44	2.26	32
27	2.28	34	2.22	28	2.185	25	2.35	42	2.45	53	2.275	34
28	2.29	35	2.22	28	2.17	23	2.33	39	2.595	72	2.16	23
29	2.24	30	2.23	29	2.165	23	2.31	37	2.53	63	2.28	34
30	2.24	30	2.235	29	2.165	23	2.385	45	2.475	57	2.29	35
31	2.22	28	2.24	30	......	.....	2.415	49	......	.....	2.29	35

§ Weir length reduced to 8.4 feet. *Width of weir changed to 8.6 feet. † Weir lengthened to 29.2 feet. ‡ Weir crest lowered from 1.83 to 1.82 on gauge.

Monthly Discharge of Beaver River at Eugenia for 1910

Drainage Area, 74 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	58	36	41	.78	.49	.57	.65
August	50	29	34	.68	.39	.47	.54
September	39	26	28	.53	.35	.39	.43
October	48	23	31	.65	.31	.43	.44
November	60	35	44	.81	.47	.60	.69
December	42	27	35	.57	.37	.47	.54
The period	60	23	35	.81	.31	.49	3.29

Monthly Discharge of Beaver River at Eugenia for 1911

Drainage Area, 74 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	51	36	43	.69	.49	.59	.68
February	55	43	49	.74	.58	.66	.69
March	192	44	83	2.59	.59	1.13	1.30
April	534	151	252	7.23	2.04	3.41	3.80
May	166	53	92	2.24	.72	1.25	1.44
June	69	32	46	.93	.43	.63	.71
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	....	....	....	....	....	....	....
November	....	....	....	....	....	....	....
December	....	....	....	....	....	....	....
The period	534	32	94	7.23	.43	1.28	8.62

Monthly Discharge of Beaver River at Eugenia for 1913

Drainage Area, 74 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May 14–31	114	72	93	1.54	.97	1.26	.84
June	99	50	66	1.34	.67	.90	1.00
July	57	35	43	.77	.47	.59	.68
August	36	29	32	.49	.39	.44	.51
September	31	25	28	.42	.34	.39	.43
October	44	27	30	.59	.36	.41	.47
November	88	30	44	1.19	.41	.59	.66
December	52	27	39	.70	.36	.53	.61
The period	114	27	44	1.54	.36	.60	5.20

Totals are computed for the period May 14th to Dec. 31st

Monthly Discharge of Beaver River at Eugenia for 1914

Drainage Area, 74 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	69	26	34	.93	.35	.47	.54
February	72	40	54	.97	.54	.74	.77
March	228	42	73	3.08	.57	.99	1.14
April	273	110	176	3.69	1.49	2.38	2.66
May	133	62	86	1.80	.84	1.17	1.35
June	69	43	50	.93	.58	.68	.76
July	48	28	35	.65	.38	.48	.55
August	46	25	31	.62	.34	.42	.48
September	30	23	25	.41	.31	.34	.38
October	49	18	31	.66	.24	.42	.48
November	72	26	41	.97	.35	.56	.62
December	71	23	41	.96	.31	.56	.64
The year	273	18	56	3.69	.24	.77	10.37

Daily Gauge Height and Discharge of Beaver River at Feversham for 1914

Drainage Area, 37 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	.....	......	.....	1.104	19	1.96	105	1.625	66	1.19	24	1.09	17	.98	10	1.00	12	.92	8	1.00	12	1.31	35
2	......	.....	......	.....	1.08	17	2.00	110	1.53	56	1.19	24	1.10	18	1.08	17	1.00	12	.92	8	.96	10	1.30	34
3	......	.....	......	.....	1.125	20	1.92	100	1.49	52	1.19	24	1.08	17	1.00	12	1.00	12	.92	8	.96	10	1.23	28
4	......	.....	......	.....	1.104	19	1.81	87	1.45	48	1.19	24	1.08	17	1.00	12	1.05	15	1.00	12	.92	8	1.22	27
5	......	.....	......	.....	1.125	20	1.73	77	1.44	47	1.19	24	1.08	17	1.00	12	1.01	12	1.10	18	1.04	14	1.21	26
6	......	.....	......	.....	1.115	20	1.69	73	1.42	45	1.19	24	1.08	17	.92	8	1.00	12	1.10	18	1.02	13	1.12	20
7	......	.....	......	.....	1.115	20	1.69	73	1.40	43	1.17	23	1.08	17	1.00	12	.88	6	1.00	12	.91	7	1.10	18
8	......	.....	......	.....	1.08	17	1.625	66	1.39	42	1.17	23	1.07	16	1.00	12	.86	5	1.13	20	.96	10	1.12	20
9	......	.....	......	.....	1.11	19	1.58	61	1.35	38	1.17	23	1.06	15	1.00	12	.85	5	1.08	17	1.03	14	1.10	18
10	......	.....	......	.....	1.12	20	1.53	56	1.35	38	1.17	23	1.06	15	1.00	12	.88	6	1.10	18	1.00	12	1.08	17
11	......	.....	......	.....	1.06	16	1.52	55	1.35	38	1.16	22	1.04	14	1.04	14	.94	9	1.10	18	1.00	12	1.09	17
12	......	.....	......	.....	1.15	20	1.53	56	1.33	36	1.16	22	1.03	14	1.12	20	.92	8	1.06	15	1.01	12	1.14	21
13	......	.....	......	.....	1.12	20	1.505	53	1.31	35	1.16	22	1.04	14	1.03	14	.96	10	1.01	12	1.02	13	1.02	13
14	......	.....	......	.....	1.12	20	1.562	59	1.30	34	1.13	20	1.06	15	1.08	17	.96	10	1.00	12	1.12	20	1.01	12
15	......	.....	......	.....	1.08	17	1.625	66	1.28	32	1.13	20	1.03	14	1.07	16	.89	6	1.00	12	1.10	18	1.09	17
16	......	.....	......	.....	1.15	22	1.68	72	1.28	32	1.13	20	1.03	14	1.04	14	.85	5	1.04	14	1.26	30	1.21	26
17	......	.....	......	.....	1.21	26	1.71	75	1.27	31	1.13	20	1.02	13	1.07	16	.85	5	.94	9	1.19	24	1.26	30
18	......	.....	......	.....	1.24	29	1.76	81	1.26	30	1.11	19	1.03	14	1.12	20	.85	5	.98	10	1.14	21	1.30	34
19	......	.....	......	.....	1.21	26	1.844	91	1.26	30	1.10	18	1.02	13	1.14	21	.89	6	.91	7	1.14	21	1.23	28
20	......	.....	......	.....	1.17	23	1.92	100	1.28	31	1.10	18	1.02	13	1.15	22	.95	9	1.02	13	1.05	10	1.10	18
21	......	.....	......	.....	1.17	23	1.77	82	1.24	28	1.11	19	1.02	13	1.08	17	.98	11	.95	9	1.12	20	1.23	28
22	......	.....	......	.....	1.14	21	1.70	74	1.23	28	1.11	19	1.00	12	1.02	13	.90	7	.96	10	1.10	18	1.19	24
23	......	.....	......	.....	1.12	20	1.615	65	1.25	29	1.13	20	1.02	13	1.01	12	.99	11	.91	7	1.02	13	1.23	28
24	......	.....	......	.....	1.13	20	1.55	58	1.24	28	1.13	20	1.04	14	1.02	13	.98	11	.95	9	1.03	14	1.20	25
25	......	.....	......	.....	1.19	25	1.55	58	1.23	28	1.11	19	1.02	13	1.03	14	.95	9	.90	7	.95	9	1.21	26
26	......	.....	......	.....	1.33	36	1.54	57	1.22	27	1.10	18	1.02	13	1.01	12	.92	8	.98	10	.94	9	1.15	22
27	......	.....	......	.....	1.64	67	1.53	56	1.22	27	1.13	20	1.00	12	1.00	12	.96	10	1.05	15	1.27	31	1.05	15
28	......	.....	......	.....	1.83	89	1.50	53	1.21	26	1.10	18	1.02	13	1.00	12	.96	10	1.01	12	1.21	26	1.04	14
29	......	.....	......	.....	1.87	94	1.625	66	1.20	25	1.15	22	1.08	17	1.00	12	.92	8	.97	11	1.19	24	1.08	17
30	......	.....	......	.....	2.00	110	1.625	66	1.21	26	1.15	22	.87	5	1.01	12	.93	8	1.00	12	1.25	29	1.06	15
31	......	.....	......	.....	2.05	116	......	.....	1.20	25	......	.....	.92	8	1.03	14	......		.99	11	......	....	1.08	17

Monthly Discharge of Beaver River at Feversham for 1914

Drainage Area, 37 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	116	16	33	3.13	.43	.90	1.04
April	110	53	71	2.97	1.43	.93	2.15
May	66	25	35	1.78	.69	.96	1.10
June	24	18	21	.67	.50	.58	.64
July	18	5	14	.50	.16	.39	.45
August	22	8	14	.59	.22	.39	.45
September	15	5	8	.41	.13	.34	.27
October	20	7	12	.55	.19	.32	.37
November	31	7	16	.84	.20	.44	.49
December	35	12	22	.94	.34	.61	.70
The period	116	5	25	3.13	.13	.68	7.66

Severn River at Severn Bridge

Location—At the highway bridge in the Town of Severn, Township of Morrison, Muskoka District.

Records Available—Monthly discharge measurements, June, 1912, to Oct., 1914. Daily gauge heights. April 5, 1913. to July 31, 1914.

Drainage Area—2,075 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, 0 to 12 feet, attached to the centre pier, on the downstream side of bridge. This gauge was installed April 5, 1912. The elevation of the zero mark, referred to sea level, is 695.00 feet.

Channel—Straight for about ¾ mile above and 1 mile below the station. Both banks are low, clean and will overflow at high stages. The bed of the stream is composed of clay and silt. The current is moderate.

Discharge Measurements—Made from the highway bridge with a large Price current meter.

Floods—The flood of April, 1913, which is the highest known, attained a height of 706 feet on the present gauge.

Control—Sparrow Lake, below the station has no effect on the stage. The nearest dam above is at Wasdell's Falls. As the flow is ample at all times for the power generated at the Hydro-Electric power plant, the water is not held back during certain portions of the day, and thus the dam has no appreciable influence on the gauge heights at Severn.

Winter Flow—During the winter months the river is covered with ice. and measurements are made through the ice to determine the winter discharge.

Observer—Geo. Blackwell, Washago, Ont.

Discharge Measurements of Severn River at Severn Bridge in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 5....	Roberts, E	....	3160	1.94	702.66	6173	....
July 3....	"	....	2567	1.35	699.76	3469	....
Aug. 1....	"	....	2294	0.98	698.66	2250	....
Sept. 3....	"	....	2276	0.93	698.56	2118	....
Oct. 3....	"	....	2100	0.81	698.06	1700	....
Nov. 5....	"	....	2411	1.11	699.69	2679	....
Dec. 3....	"	....	2510	1.40	700.06	3504	....
1913							
Jan. 7....	"	....	2407	1.04	699.56	2526	....
Feb. 3....	"	....	2449	1.15	699.86	2837	....
Mar. 6....	"	....	2258	1.03	698.86	2348	....
April 5....	"	....	3598	2.49	705.46	8981	....
May 5....	"	....	2778	1.86	701.46	5172	....
June 3....	Murray, W. S...	205	2389	1.45	699.56	3479	....
July 1....	"	200	2233	0.91	698.76	2039	....
Aug. 1....	"	192	1998	0.43	697.46	860	....
Sept. 3....	"	197	1961	0.31	697.26	626	....
Oct. 2....	"	184	1912	0.24	697.16	460	....
Oct. 24 (b)	"	186	1747	0.20	696.16	344	....
Nov. 4 (a)	McLennan, C. C.	183	1742	0.20	696.36	361	....
Nov. 11 (b)	Murray, W. S...	112	642	1.04	697.08	947	....
Nov. 21 (b)	"	112	1021	1.10	697.21	1123	....
Dec. 6 (b)	"	110	1026	1.12	697.77	1158	....
Dec. 16 (b)	"	110	1001	1.03	697.28	1028	....
1914							
Jan. 7 (b)	"	110	1078	1.01	697.33	1093	....
Feb. 6 (b)	"	110	921	0.79	696.54	734	....
Mar. 7 (b)	"	110	971	0.82	696.58	802	....
April 1....	"	194	2313	1.37	699.70	3185	....
May 6 (b)	"	111	1122	2.09	699.41	2348	....
June 3 (b)	"	111	1022	1.31	697.75	1344	....
July 7 (b)	"	111	833	0.86	697.12	720	....
Aug. 5 (b)	"	87	758	0.39	696.58	295	....
Sept. 8 (b)	"	101	587	0.35	696.97	207	....
Oct. 5 (c)	"	....	23	4.40	694.80	99	....
Nov. 2 (c)	"	....	51	4.39	695.05	224	....
Dec. 3....	"	200	2263	0.93	698.83	2126	....

(a) Measurement taken at Wasdell's Falls
(b) Measurement taken at Dalton Road Bridge
(c) Measurement computed from flow through dam and machine at Wasdell's Falls plant
(d) Backwater caused by log jam

Daily Gauge Height and Discharge of Severn River at Severn Bridge for 1913

Drainage Area, 2,075 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	698.84	1920	700.26	3120	699.01	2050	705.99	9340	701.93	5525	699.80	3375	698.62	2200	697.31	1075	697.22	1010	696.81	740	696.50	550	697.73	1410
2	698.84	1920	700.26	3120	699.01	2050	705.95	9270	701.87	5450	699.74	3325	698.58	2150	697.16	950	697.26	1025	696.81	740	696.46	520	697.67	1350
3	698.84	1920	700.18	3050	698.97	2015	705.91	9195	701.73	5300	699.64	3225	698,47	2025	697,07	900	697.26	1025	696.81	740	696.42	500	697.69	1360
4	698.84	1920	700.09	2980	698.93	1980	705,91	9195	701.60	5175	699.58	3175	698.41	1975	697.03	875	697.26	1025	696.89	790	696.42	500	697.77	1440
5	698.84	1920	700.01	2910	698.88	1950	705.47	*9050	701.50	5075	699.45	3050	698.32	1900	696.95	825	697.26	1025	696.89	790	696.40	475	697.81	1490
6	698.84	1920	699.93	2840	698.84	1920	705.39	8950	701.39	4975	699.51	3100	698.24	1825	696.93	810	697.24	1020	696.89	790	696.33	450	697.79	1450
7	698.84	1920	699.84	2770	698.80	1885	705.31	8900	701.22	4800	699.51	3100	698.26	1850	696.90	800	697.22	1010	697.05	875	696.33	450	697.71	1380
8	668.84	1920	699.76	2700	698.76	1850	705.28	8850	701.05	4625	699.45	3050	698.22	1810	696.95	825	697.13	945	697.05	875	696.40	475	697.73	1410
9	698.84	1920	699.68	2620	698.64	1745	705.12	8700	700.89	4475	699.37	2950	698.14	1750	697.00	850	697.06	890	697.05	875	696.48	535	697.56	1275
10	698.84	1920	699.58	2540	698.51	1640	705.07	8625	700.76	4350	699.26	2850	698.07	1675	697.01	850	696.99	845	697.05	875	696.63	625	697.60	1300
11	698.84	1920	699.51	2470	698.59	1710	705.09	8650	700.74	4325	699.22	2800	697.99	1625	697.01	855	696.97	835	696.99	845	697.00	850	697.60	1300
12	698.92	1985	699.43	2400	698.68	1780	705.05	8600	700.59	4175	699.16	2750	697.99	1625	697.01	855	696.95	825	696.93	810	697.27	1040	697.50	1225
13	699.01	2050	699.39	2375	698.85	1915	704.93	8500	700.55	4150	699.08	2650	697.99	1625	697.05	875	696.93	810	696.59	590	697.29	1050	697.44	1165
14	698.92	1985	699.35	2355	699.01	2050	704.80	8375	700.51	4125	698.93	2525	697.95	1600	697.07	900	696.85	760	696.59	590	697.00	850	697.44	1165
15	698.84	1920	699.27	2275	699.72	2665	704.66	8225	700.45	4050	698.88	2475	697.93	1575	697.09	925	696.76	700	696.47	525	696.99	845	697.35	1100
16	698.80	1880	699.18	2200	700.43	3280	704.61	8175	700.34	3950	698.80	2375	697.86	1500	697.14	950	696.85	760	696.28	410	696.90	800	697.25	1035
17	698.76	1840	699.14	2165	700.85	3655	704.43	8000	700.34	3950	698.76	2325	697.93	1575	697.18	990	696.76	700	696.18	370	696.77	700	697.19	995
18	699.01	2050	699.10	2130	701.26	4030	704.30	7875	700.34	3950	698.71	2275	697.99	1625	697.18	990	696.76	700	696.26	400	696.73	675	697.17	985
19	699.26	2260	699.09	2130	701.51	4265	704.16	7725	700.32	3925	698.87	2450	697.99	1625	697.18	990	696.76	700	696.11	315	696.88	785	697.08	905
20	699.51	2480	699.09	2130	701.76	4500	703.93	7500	700.14	3750	698.82	2400	697.95	1600	697.18	990	696.76	700	696.15	350	697.04	865	697.10	925
21	699.76	2700	699.09	2130	702.68	5390	703.64	7225	700.10	3700	698.87	2450	697.93	1575	697.18	990	696.76	700	696.11	315	697.19	990	697.27	1050
22	699.93	4840	699.09	2130	703.59	6280	703.49	7075	700.12	3725	698.97	2560	697.91	1550	697.18	990	696.76	700	695.99	275	697.46	1200	697.41	1160
23	700.09	2980	699.09	2130	704.04	6730	703.30	6900	700.10	3700	698.91	2500	697.86	1500	697.18	990	696.85	760	695.97	260	697.63	1325	697.48	1210
24	700.18	3050	699.09	2130	704.49	7180	703.03	6600	700.10	3700	698.87	2450	697.80	1450	697.20	1000	696.76	700	696.05	285	697.71	1380	697.67	1350
25	700.26	3120	699.09	2130	704.82	7500	703.78	7350	700.10	3700	698.87	2450	697.89	1525	697.18	990	696.76	700	695.97	260	697.77	1440	697.67	1350
26	700.26	3120	699.09	2130	705.15	7820	702.41	6000	700.03	3625	698.91	2500	697.84	1475	697.18	990	696.76	700	696.05	285	697.83	1475	697.73	1410
27	700.26	3120	699.05	2090	705.32	7985	702.30	5900	699.95	3550	698.85	2425	697.81	1460	697.18	990	696.76	700	696.42	500	697.77	1440	697.75	1425
28	700.26	3120	699.01	2050	705.49	8150	702.22	5800	699.86	3450	698.82	2400	697.76	1425	697.18	990	696.76	700	696.50	550	697.75	1425	697.83	1505
29	700.26	3120	......	.....	705.53	8190	702.07	5650	699.84	3425	698.76	2325	697.76	1425	697.20	1000	696.81	740	696.50	550	697.65	1340	697.83	1505
30	700.26	3120	......	.....	705.57	8230	702.01	5600	699.80	3375	698.66	2225	697.58	1285	697.22	1010	696.85	760	696.50	550	697.71	1380	697.83	1505
31	700.26	3120	......	.....	705.78	8785	......	.....	699.80	3375	......	.....	697.45	1175	697.26	1025	......	.....	696.50	550	......	.....	697.73	1410

*Severn Bridge gauge installed April 5, 1913.

Daily Gauge Height and Discharge of Severn River at Severn Bridge for 1914

Drainage Area 2,075 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	697.65	1290	696.46	690	696.67	790	696.62	3000	699.42	2800	698.04	1520
2	697.59	1260	696.46	690	696.71	810	700.12	3500	699.42	2800	697.83	1400
3	697.55	1235	696.50	710	696.69	800	700.33	3680	699.42	2800	697.83	1400
4	697.50	1205	696.50	710	696.67	790	700.37	3720	699.42	2800	697.79	1370
5	697.54	1230	696.52	720	696.67	790	700.42	3770	699.42	2800	697.75	1350
6	697.46	1180	696.60	755	696.63	770	700.40	3750	699.42	2800	697.75	1350
7	697.33	1120	696.66	780	696.63	770	700.33	3680	699.42	2800	697.75	1350
8	697.27	1080	696.73	820	696.62	770	700.27	3620	699.50	2880	697.75	1350
9	697.25	1075	696.81	855	696.58	750	700.17	3550	699.50	2880	697.67	1300
10	697.23	1070	696.96	925	696.58	750	700.13	3500	699.50	2880	697.50	1205
11	697.17	1040	697.02	960	696.58	750	700.14	3420	699.50	2880	697.46	1180
12	697.11	1005	697.27	1080	696.50	710	699.88	3250	699.38	2760	697.42	1160
13	697.08	990	697.25	1075	696.50	710	699.81	3200	699.25	2620	697.42	1160
14	697.08	990	697.25	1075	696.50	710	699.67	3020	699.21	2600	697.16	1025
15	697.08	990	697.25	1075	696.45	685	699.56	2940	699.17	2550	697.13	1015
16	697.08	990	697.17	1030	696.41	665	699.48	2850	699.08	2470	697.08	990
17	697.08	990	697.31	1105	696.50	710	699.40	2770	698.92	2320	697.08	990
18	697.00	950	697.44	1175	696.50	710	699.33	2700	698.83	2250	696.92	910
19	696.94	920	697.52	1220	696.50	710	699.25	2620	698.67	1975	696.92	910
20	696.91	900	697.50	1205	696.54	730	699.25	2620	698.46	1810	696.92	910
21	696.85	875	697.32	1110	696.58	750	699.33	2700	698.29	1690	696.92	910
22	696.75	830	697.31	1105	696.64	775	699.33	2700	698.33	1715	696.83	865
23	696.65	780	697.25	1075	696.73	820	699.33	2700	698.33	1715	696.83	865
24	696.56	735	697.23	1070	696.75	830	699.33	2700	698.25	1660	696.75	830
25	696.50	710	697.13	1015	696.75	830	699.33	2700	698.25	1660	696.75	830
26	696.46	690	696.98	940	696.87	885	699.30	2670	698.25	1660	696.67	790
27	696.50	710	696.83	865	697.02	960	699.42	2800	698.33	1715	696.58	750
28	696.50	710	696.77	840	697.79	1370	699.42	2800	698.42	1780	696.67	790
29	696.42	670	....	.....	698.37	1745	699.42	2800	698.35	1715	696.75	830
30	696.42	670	....	.....	698.91	2500	699.42	2800	698.33	1715	696.83	865
31	696.42	670	....	.....	699.39	2770	....	.....	698.31	1700	....	.....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	696.92	910	696.52	645	....	Dam at Washago closed.	695.25	Discharges for low gauge heights indefinite.	....	.....	698.27	1473
2	696.92	910	696.50	635	....		695.17		....	.....	698.86	1920
3	696.92	910	696.50	635	....		695.06		....	.....	699.02	2060
4	696.92	910	696.55	658	....		....		....	.....	698.88	1940
5	696.92	910	696.50	635	....		694.83		....	.....	699.11	2130
6	696.96	925	696.50	635	....		694.75		....	.....	699.06	2090
7	696.88	890	696.35	570	....		694.75		....	.....	698.77	1850
8	696.88	890	696.35	570	....		....		....	.....	698.65	1750
9	696.88	890	....	.....	....		694.70		....	.....	698.44	1568
10	696.83	875	....	.....	....		694.70		....	.....	698.23	1450
11	696.96	925	....	.....	....		....		....	.....	698.02	1338
12	697.00	950	....	.....	....		....		....	.....	697.94	1297
13	697.00	950	....	.....	....		....		....	.....	697.77	1212
14	697.06	975	....	.....	....		....		....	.....	697.56	1110
15	697.17	1030	....	.....	....		....		....	.....	697.52	1093
16	697.17	1030	696.38	585	....		....		....	.....	697.61	1135
17	697.23	1070	696.42	601	....		....		....	.....	697.27	976
18	697.27	1085	696.48	628	....		....		....	.....	697.19	939
19	697.33	1230	696.59	675	....		....		697.86	1259	697.19	939
20	697.29	1195	696.76	750	....		....		697.86	1259	697.11	900
21	697.25	1150	696.85	790	....		....		697.86	1259	697.11	900
22	697.25	1150	696.85	790	....		....		697.78	1219	697.11	900
23	697.25	1150	696.90	810	....		....		697.78	1215	696.94	826
24	697.17	1030	696.94	826	....		....		697.61	1135	696.94	826
25	697.10	1000	696.92	818	....		....		697.61	1135	696.77	753
26	697.02	960	696.93	822	....		....		697.61	1135	696.77	753
27	697.00	950	696.94	826	695.25		....		697.77	1212	696.61	683
28	696.96	930	686.94	826	695.33		....		697.86	1259	696.52	645
29	696.88	890	696.92	818	695.33		....		697.77	1212	696.44	610
30	696.83	865	....	.....	695.33		....		697.94	1297	696.44	610
31	696.77	840	....	.....	....		....		....	.....	696.44	610

NOTE.—Commencing Aug. 1st gauge heights were read at Wasdell's Falls.

Monthly Discharge of Severn River at Severn Bridge for 1913

Drainage Area, 2,075 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	4,840	1,840	2,419	2.33	.89	1.17	1.39
February	3,120	2,050	2,432	1.51	.99	1.17	1.26
March	8,785	1,640	4,231	4.24	.79	2.04	2.42
April...........	9,340	5,600	7,858	4.50	2.70	3.79	4.23
May	5,525	3,375	4,175	2.66	1.63	2.01	2.32
June	3,375	2,225	2,680	1.63	1.07	1.29	1.44
July	2,200	1,175	1,644	1.06	.57	.79	.91
August	1,075	800	937	.52	.39	.45	.52
September	1,025	700	815	.49	.34	.39	.43
October	875	260	570	.42	.13	.27	.31
November.......	1,475	450	898	.71	.21	.43	.50
December	1,505	905	1,276	.73	.44	.62	.73
The year.......	9,340	260	2,496	4.50	.13	1.20	16.46

Monthly Discharge of Severn River at Severn for 1914

Drainage Area, 2,075 Square Miles

Month	Discharge in Secoud-feet			Drainage iu Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	1,290	670	953	.62	.32	.46	.55
February	1,220	690	953	.59	.33	.46	.49
March..........	2,770	665	933	1.34	.32	.45	.53
April...........	3,770	2,620	3,084	1.82	1.26	1.48	1.65
May............	2,880	1,660	2,297	1.38	.80	1.34	1.55
June	1,520	750	1,072	.73	.36	.52	.58
July............	1,195	840	979	.58	.41	.47	.54
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October.........	....	....	....	....	....	....	....
November	....	....	....	....	....	....	....
December........	2,130	610	1,203	1.03	.29	.58	.67
The period......	3,770	665	1,469	1.82	.32	.71	5.89

Note—Totals are computed for the period January 1st to July 31st.

Black River near Washago

Location.—At the highway bridge known as Kennedy's Bridge, four miles above the first highway bridge, which crosses the river on the main road from the Town of Washago, and about 5 miles southeast of the Town of Washago, Township of Mara, Ontario County. The old station was located at the first highway bridge.

Records Available.—Monthly discharge measurements, Aug., 1913, to Dec., 1914.

Drainage Area.—598 square miles.

Gauge.—A bench mark gauge (elevation 30.00) painted on a tie rod on the downstream side of the bridge, from which measurements are taken to the surface of the water, by means of a graduated staff.

Channel.—Straight for about 300 feet above and 1 mile below the station. Both banks are low, wooded and liable to overflow at high stages. The bed of the stream is composed of rock and clay, practically permanent. The current is moderate, one channel existing at all stages of the river.

Discharge Measurements.—Made from bridge with a large Price current meter.

Control.—During low flows in the summer, a number of temporary dams are built to collect the water for floating logs down the stream, thus interfering with the natural flow of the river.

Winter Flow.—Measurements are made through the ice during the winter months to determine the winter discharge.

Discharge Measurements of Black River near Washago in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
Aug. 1....	Murray, W. S...	34	42	2.93	18.80	124	.21
Sept. 3....	" ..	34	29	1.50	18.40	45	.08
Oct. 2 (a)	" ..	12	6	0.50	17.90	3	.00
Nov. 21....	" ..	84	705	0.96	19.40	674	1.12
Dec. 6....	" ..	84	706	1.01	19.60	718	1.20
Dec. 16....	" ..	84	682	0.98	19.30	673	1.12
1914							
Jan. 8 (b)	" ..	....	701	0.41	19.50	289	.48
Feb. 6 (c)	" ..	....	608	0.76	22.30	465	.78
Mar. 7....	" ..	100	550	0.59	21.70	330	.55
April 2....	" ..	120	1233	2.13	25.90	2629	4.39
May 6....	" ..	120	1154	2.14	24.75	2476	4.14
June 3....	" ..	120	611	1.31	22.40	805	1.35
July 7(d)	" ..	95	432	0.21	21.00	93	.16
Sept. 8....	" ..	90	401	0.24	20.70	95	.16
Oct. 5....	" ..	95	417	0.18	20.80	75	.13
Nov. 2 (e)	" ..	95	405	0.13	20.65	52	.09
Dec. 3....	" ..	120	829	2.06	24.50	1708	2.86

(a) Water held back for log drive
(b) Backwater from Severn River caused by dam at Wasdell's Falls.
(c) New section located at Kennedy's Bridge, 4 miles up stream.
(d) Logs in stream.
(e) Backwater from temporary dam below section.

Muskoka River (South Branch) at Tretheway's Falls

Location—At a small steel highway bridge known as Tretheway's Falls Bridge, about 1 mile south of the Muskoka Falls Post Office and about 7 miles south of the Town of Bracebridge, Township of Draper, Muskoka District.

Records Available—Monthly discharge measurements. Aug., 1912, to July. 1914. Daily gauge heights, June 4 to Dec. 31, 1914.

Drainage Area—658 square miles.

Gauge—As there is no available place for establishing a permanent staff gauge, a bench mark (elevation 25.00), painted on a stringer, on the up-stream side of the bridge, is used in ascertaining the water elevation, by measuring down to the surface of the stream with a graduated staff. It is referred to a bench mark (elevation 33.08) painted on a large rock on the right bank, 90 feet to the right of the downstream side of the bridge.

Channel—Straight for about 300 feet above and 300 feet below the station. The banks are fairly high, rocky and wooded and will not overflow. The current is very swift and the bed of stream is rough and rocky, with a heavy slope about 250 feet below the section.

Discharge Measurements—Made from the upstream side of the bridge.

Winter Flow.—The gauge is located where the current is swift and ice seldom forms across the river for the entire width. The relation, therefore, between the gauge height and the discharge is not affected by ice.

Control—During the summer months the river is used extensively for log driving.

Accuracy—A fairly well-defined rating curve has been established from the monthly discharge measurements.

Observer—Wesley Morrow, Muskoka Falls, Ontario.

Discharge Measurements of Muskoka River (South Branch) at Tretheway's Falls in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Aug. 2(a).	Roberts, E.	....	295	4.53	16.60	1337	....
Sept. 4....	"	....	146	2.39	13.30	349	....
Oct. 5....	"	....	154	2.69	13.50	414	....
Nov. 6....	"	....	198	6.35	14.50	1258	....
Dec. 4(b).	"	....	294	4.19	16.50	1232	....
1913							
Jan. 8....	"	....	209	5.24	14.70	1096	....
Feb. 4....	"	....	245	5.15	15.50	1262	....
Mar. 8....	"	....	227	5.49	15.10	1248	....
Apr. 7....	"	....	428	17.05	19.00	7312	....
May 6....	"	....	317	6.86	16.90	2175	....
June 4....	Murray, W. S...	50	191	4.46	14.30	855	....
July 2....	"	50	153	2.62	13.50	408	....
Aug. 1....	"	50	232	5.70	15.20	1324	....
Sept. 3....	"	50	119	2.44	12.60	292	....
Oct. 14....	"	50	107	1.90	12.30	204	....
Nov. 12....	"	45	116	2.93	13.30	339	....
Dec. 7....	"	50	171	3.85	13.90	658	....
1914							
Jan. 8....	"	50	155	2.32	13.50	360	....
Feb. 7....	"	50	187	4.13	14.20	773	....
Mar. 8....	"	50	178	4.36	14.00	777	....
Apr. 2....	"	50	191	4.18	14.30	802	....
May 7....	"	50	325	8.75	17.10	2840	....
June 4(c).	"	50	244	5.38	15.55	1312	....
July 7....	"	50	233	6.26	15.20	1459	....

(a) Log drive, water raised 3 feet in a few hours.
(b) Float measurement
(c) Logs in stream

Daily Gauge Height and Discharge of Muskoka River (South Branch) at Tretheway's Falls for 1914

Drainage Area, 658 Square Miles

Day	January Gauge Ht. Feet	January Dis-charge Sec-ft.	February Gauge Ht. Feet	February Dis-charge Sec-ft.	March Gauge Ht. Feet	March Dis-charge Sec-ft.	April Gauge Ht. Feet	April Dis-charge Sec-ft.	May Gauge Ht. Feet	May Dis-charge Sec-ft.	June Gauge Ht. Feet	June Dis-charge Sec-ft.	July Gauge Ht. Feet	July Dis-charge Sec-ft.	August Gauge Ht. Feet	August Dis-charge Sec-ft.	September Gauge Ht. Feet	September Dis-charge Sec-ft.	October Gauge Ht. Feet	October Dis-charge Sec-ft.	November Gauge Ht. Feet	November Dis-charge Sec-ft.	December Gauge Ht. Feet	December Dis-charge Sec-ft.
1													16.83	2450	12.67	280	12.83	325	12.58	240	12.92	350	13.75	650
2													16.83	2450	12.67	280	12.83	325	12.67	280	12.83	325	14.00	750
3													16.50	2200	12.75	300	12.92	350	12.67	280	12.83	325	14.25	870
4											15.50	1[illegible]25	16.00	1830	12.75	300	12.92	350	12.58	240	12.75	300	14.00	750
5											15.58	1560	15.67	1630	12.83	325	12.92	350	12.58	240	12.67	280	13.75	650
6											15.50	1525	15.62	1600	12.83	325	12.83	325	12.67	280	12.67	280	13.67	610
7											13.67	610	16.42	2140	12.75	300	12.92	350	12.67	280	12.75	300	13.67	610
8											15.33	1440	15.58	1560	12.75	300	12.92	350	12.75	300	12.67	280	13.58	580
9											15.42	1480	15.83	1740	12.75	300	12.83	325	12.75	300	12.67	280	13.50	550
10											14.83	1160	15.33	1440	13.00	360	12.83	325	12.83	325	12.75	300	13.42	510
11											15.00	1250	15.58	1560	13.00	360	12.92	350	12.83	325	12.83	325	13.42	510
12											16.00	1830	15.00	1250	12.92	350	12.83	325	12.83	325	13.00	360	13.50	550
13											14.83	1160	15.00	1250	12.83	325	12.92	350	12.75	300	13.00	360	13.50	550
14											14.50	1000	15.00	1250	12.75	300	12.83	325	12.75	300	13.00	360	13.50	550
15											14.00	750	15.42	1480	12.75	300	12.83	325	12.83	325	13.17	420	13.42	510
16											13.83	680	15.00	1250	12.75	300	12.67	280	12.83	325	13.58	580	13.42	510
17											14.67	1080	15.00	1250	12.83	325	12.58	240	12.83	325	13.42	510	13.50	550
18											14.50	1000	13.00	360	12.83	325	12.58	240	12.83	325	13.33	475	13.50	550
19											14.58	1030	13.17	420	12.92	350	12.50	220	12.75	300	13.25	450	13.58	580
20											14.75	1120	13.00	360	13.00	360	12.50	220	12.75	300	13.25	450	13.58	580
21											14.42	960	13.00	360	13.00	360	12.67	280	12.67	280	13.17	420	13.58	580
22											14.75	1120	13.17	420	12.92	350	12.75	300	12.67	280	13.17	420	13.67	610
23											14.75	1120	13.17	420	12.83	325	12.88	325	12.58	240	13.17	420	13.67	610
24											14.17	830	13.00	360	12.92	350	12.83	325	12.58	240	13.33	475	13.75	650
25											14.00	750	13.00	360	12.92	350	12.75	300	12.58	220	13.58	580	13.83	680
26											13.50	550	12.92	350	12.83	325	12.75	300	12.50	220	13.58	580	13.83	680
27											15.00	1250	12.83	325	12.75	300	12.75	300	12.67	280	13.67	610	13.67	610
28											14.67	1080	12.75	300	12.83	325	12.75	300	12.67	280	13.83	680	13.75	650
29											15.00	1250	12.75	300	12.67	280	12.67	280	12.75	300	14.00	750	13.83	680
30											15.50	1525	12.83	325	12.75	300	12.67	280	12.83	325	13.83	680	14.00	750
31													12.75	300	12.75	300			13.00	360			14.00	750

Monthly Discharge of Muskoka River (South Branch) at Tretheway's Falls for 1914

Drainage Area, 658 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June 4th–30th	1,560	550	1,135	2.37	.84	1.73	1.74
July	2,450	300	1,074	3.73	.46	1.63	1.88
August	360	280	320	.55	.43	.49	.56
September	350	220	308	.53	.33	.47	.52
October	360	220	288	.55	.33	.44	.51
November	750	280	431	1.14	.43	.66	.74
December	870	510	620	1.32	.77	.94	1.08
The period	2,450	220	589	3.73	.33	.89	7.03

Totals are computed for the period June 4 to December 31

Discharge Measurements of Muskoka River (North Branch) at High Falls (a) in 1912-3

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 6....	Roberts, E......	....	878	3.22	....	2828	2.91
July 3....	"	....	59	2.54	....	150	0.15
Aug. 3....	"	....	65	2.91	....	193	0.20
Sept. 4....	"	....	65	3.39	21.81	215	0.22
Oct. 4....	"	....	96	4.07	22.31	391	0.40
Nov. 6....	"	....	666	1.71	23.70	1139	1.18
Dec. 4....	"	....	820	3.95	25.90	3242	3.36
1913							
Jan. 8....	"	....	670	1.70	23.80	1141	1.18
Feb. 4....	"	....	150	1.40	24.20	1561	1.62
March 7....	"	....	693	1.85	24.00	1268	1.31
April 6....	"	....	1144	5.71	27.00	6608	6.85
May 6....	"	....	800	2.95	24.60	2367	2.46
June 4....	Murray, W. S. ..	104	645	1.31	23.60	847	0.88
July 2....	"	72	102	1.94	22.50	200	0.21
Aug. 1....	"	74	85	3.72	22.30	318	0.33
Sept. 4....	"	60	68	3.40	22.10	235	0.24
Oct. 14....	"	56	59	2.91	22.70	171	0.18
Nov. 12....	"	109	725	2.14	24.00	1552	1.62

(a) This station has been discontinued

Discharge Measurements Muskoka River (Main Stream) at Bala (a) in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Sept. 12....	Roberts, E.	....	900	1.87	....	1684	0.72
Oct. 12....	"	....	893	1.87	....	1664	0.71
Nov. 14....	"	....	1035	5.59	....	5797	2.48
Dec. 12....	"	....	982	6.85	....	6732	2.88
1913							
Jan. 14....	"	....	835	3.16	....	2646	1.13
Feb. 12....	"	....	784	4.62	....	3263	1.39
Mar. 15....	"	....	716	5.23	....	3748	1.60
Apr. 12....	"	....	1460	9.29	....	13576	5.80
May 9....	Murray, W. S...	113	1002	6.36	....	6377	2.72
June 11....	"	113	841	0.97	....	818	0.35
July 9....	"	113	861	0.17	....	150	0.06
Aug. 13....	"	113	818	0.59	....	484	0.21
Sept. 12....	"	113	625	0.09	....	57	0.02
Oct. 22....	"	113	796	0.28	....	224	0.10
Nov. 20....	"	189	1003	1.95	....	1962	0.84
Dec. 15....	"	189	799	2.02	....	2333	1.00
1914							
Jan. 15....	"	189	1127	1.55	....	1820	0.78
Feb. 14....	"	182	880	1.73	....	1518	0.65
Mar. 14....	"	182	802	1.72	....	1376	0.59
Apr. 8....	"	182	1162	3.84	....	4468	1.91
May 14....	"	182	1065	2.93	....	3131	1.34

(a) This station discontinued on account of backwater from dam.

Seguin River near Parry Sound

Location—500 feet below Mountain dam, about 2 miles above the highway bridge. 4 miles above Mill Lake dam, and about 7 miles above the Town of Parry Sound, Township of McDougal, Parry Sound District. The old station was located at the highway bridge.

Records Available—Monthly discharge measurements, June, 1912, to Dec., 1914.

Drainage Area—363 square miles.

Gauge—A bench mark painted on the side of a large rock, which projects from the right bank about 2 feet over the water. It is located at the cross-section, and measurements are made from this bench mark (elevation 15.00) to the surface of the water by means of a graduated staff.

Channel—Straight for about 300 feet above and 500 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of rocks and boulders. The current is swift and flows through one channel at all stages of the river.

Discharge Measurements—Made at low and ordinary stages with a Price current meter by wading. During high water, measurements are made at the highway bridge.

Control—The Mountain dam, 500 feet above the station, causes fluctuation at the gauge when operated. The Mill Lake dam, 4 miles downstream, has no effect on the station.

Winter Flow—Ice forms along the bank at the station during the winter months, but the river is entirely covered with ice above and below.

Discharge Measurements of Seguin River near Parry Sound in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 8 (a)	Roberts, E	....	516	2.73	11.10	1406	3.87
July 5....	"	....	510	0.58	11.00	293	0.81
Aug. 8....	"	....	321	0.59	8.00	189	0.52
Sept. 11....	"	....	327	0.74	8.40	243	0.67
Oct. 11....	"	....	189	0.64	6.20	121	0.33
Nov. 12....	"	....	473	2.18	10.70	1034	2.85
Dec. 12....	"	....	586	3.89	12.50	2283	6.29
1913							
Jan. 13....	"	63	473	2.15	10.70	1016	2.80
Feb. 11....	"	63	523	1.35	11.50	710	1.95
Mar. 14....	"	63	470	1.46	10.80	700	1.93
April 11....	"	63	605	4.72	12.80	2849	7.85
May 9....	"	63	529	1.32	11.60	700	1.93
June 10....	Murray, W. S...	63	523	0.57	11.50	299	0.82
July 8....	"	63	334	0.24	8.20	82	0.23
Aug. 12....	"	63	145	1.16	5.20	168	0.46
Sept. 10....	"	63	151	0.92	5.30	139	0.38
Oct. 21....	"	63	145	1.46	5.20	197	0.54
Nov. 20....	"	63	535	1.74	11.70	937	2.58
Dec. 14....	"	63	506	1.58	11.28	805	2.22
1914							
Jan. 15....	"	63	420	0.62	9.90	260	0.72
Feb. 14....	"	63	422	1.03	9.90	435	1.20
April 8....	"	63	431	4.71	10.05	2036	5.60
May 14....	"	63	510	1.64	11.30	833	2.30
June 11 (b)	"	98	146	2.25	11.00	328	0.90
Aug. 15....	"	85	144	3.63	11.00	521	1.44
Sept. 17....	"	68	71	2.27	10.40	161	0.44
Oct. 11....	"	63	164	0.99	10.05	161	0.44
Nov. 10....	"	60	76	2.18	10.35	166	0.46
Dec. 11....	"	72	94	2.36	10.70	220	0.61

(a) Gauge heights at old section affected by backwater from Mill Lake Dam.
(b) New section established

Maganetawan River near Katrine

Location—The wading section is 400 yards east of the Grand Trunk Railway tracks; and 2½ miles south of the Katrine Station in the Township of Armour, Parry Sound District. For high stages, a highway bridge known as Katrine Bridge is used, 1 mile west of the Katrine Railway Station.

Records Available—Discharge measurements, June, 1912, to Dec., 1914.

Drainage Area—151 square miles.

Gauge—A bench mark gauge at the wading section (elev. 10.00) painted on a rock in the centre of the river, from which measurements are made to the surface of the water, by means of a graduated staff. A vertical staff gauge with enamelled face, graduated in feet and inches. is located at the bridge station and fastened to pile in the centre of river, on the upstream side. The zero of the gauge (elev. 18.00), is referred to a bench mark (elev. 33.13) on a square stump, 625 feet along the road to the right of the bridge.

Channel—Straight at the wading section for about 500 feet above and 500 feet below the station. The banks are low, sandy, wooded, and liable to overflow at high stages. The bed of the stream is composed of gravel and is shifting. The current is swift. At the bridge the bed is composed of clay and sand, the current flowing very slowly.

Discharge Measurements—Made from the bridge at high stages and at the wading section at low and ordinary stages of the river, by means of a large Price current meter.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is affected by ice from about December to January.

Discharge Measurements of Maganetawan River near Katrine in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 15....	Roberts, E	....	785	0.60	20.30	473	3.16
July 4....	"	....	741	0.26	19.40	192	1.27
Aug. 3....	"	....	75	1.40	....	105	0.69
Sept. 5 (b)	"	....	75	1.43	8.40	107	0.71
Oct. 7 (b)	"	....	80	1.65	8.50	132	0.87
Nov. 8....	"	....	735	0.57	19.80	418	2.76
Dec. 5....	"	....	795	0.74	20.50	583	3.85
1913							
Jan. 9....	"	....	711	0.31	19.60	227	1.50
Feb. 5 (b)	"	....	148	2.02	9.10	300	1.98
Mar. 9 (b)	"	....	128	1.70	8.90	205	1.35
April 8....	"	....	1036	1.36	23.40	1415	9.35
May 6....	"	83.5	835	0.97	21.00	817	5.39
June 5....	Murray, W. S...	84.5	737	0.48	19.40	358	2.36
July 3 (b)	"	100	61	1.26	8.25	77	0.51
Aug. 1....	"	105	48	1.24	18.50	59	0.39
Sept. 4 (b)	"	93	47	1.35	8.15	64	0.42
Oct. 15 (b)	"	100	61	1.46	8.40	89	0.59
Nov. 13....	"	81	702	0.52	19.40	366	2.42
Dec. 8....	"	81	762	0.53	20.10	407	2.69
1914							
Jan. 9....	"	84.5	611	0.05	18.41	32	0.21
Mar. 8....	"	100	113	1.75	18.00	497	1.30
April 3....	"	84.5	652	0.74	18.67	484	3.19
May 8 (a)	"	....	890	0.62	21.70	555	3.66
June 6....	"	85	734	0.84	19.79	620	4.09
July 10 (b)	"	100	56	1.41	8.20	79	0.52
Aug. 6 (b)	"	60	25	1.77	8.05	43	0.28
Sept. 10 (b)	"	110	207	1.45	9.60	300	1.98
Oct. 6 (b)	"	75	26	1.96	8.05	52	0.34
Nov. 3 (b)	"	100	72	1.42	8.50	102	0.67
Dec. 4....	"	84.5	745	0.93	19.91	681	4.49

(a) Dam closed at time of measurement (b) Wading section at low stages

Maganetawan River at Knoeffler's Falls

Location—At the wooden highway bridge known as Knoeffler's Bridge, 200 feet below Ahmic Lake Dam, and 5 miles below the Village of Maganetawan, Township of Chapman, Parry Sound District.

Records Available—Monthly discharge measurements. Aug. to Dec., 1914.

Drainage Area—Not measured.

Gauge—A bench mark gauge (elev. 30.00) painted on a wooden brace, projecting from the downstream side of the bridge, 15 feet to the right of the centre pier. It is referred to a permanent bench mark (elev. 27.24) painted on a rock on the right bank. 50 feet above the bridge.

Channel—At the station, the river flows in 2 channels separated by a small island. Both channels are straight for about 200 feet above and 150 feet below the section, where they gradually converge and flow in a straight course for about 1,000 feet. The banks are high, rocky, wooded, and will not overflow nor completely submerge the island. The bed of the stream is rocky, and the current swift.

Discharge Measurements—Made from bridge with a large Price current meter.

Control—The Ahmic Lake Dam, 200 feet above the station, is used to raise the elevation in the lake for aid in navigation. The operation of the dam interferes with the natural flow of the river. The bed of the stream in the centre, at the dam, is very high, and the greater amount of water flows through that channel, above which, the dam is opened; thus necessitating a gauge in each channel at the station.

Winter Flow—Both channels are open during the winter months.

Accuracy—As only a few discharge measurements were made, there are not sufficient data to establish a station rating curve.

Discharge Measurements of Maganetawan River at Knoeffler's Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
Aug. 7....	Murray, W. S...	....	53	6.90	17.90	370	....
Sept. 9....	"	....	45	5.35	17.75	243	....
Oct. 6....	"	....	62	6.23	18.25	384	....
Nov. 3....	"	....	63	7.76	18.80	490	....
Dec. 5....	"	....	159	13.52	21.00	2151	....

Discharge Measurements of Maganetawan River at Burk's Falls (a) in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
June 14....	Roberts, E.......	....	1062	1.41	17.50	1504	....
July 5....	"	....	675	0.50	....	340	....
Aug. 4....	"	....	96	2.50	....	240	....
Sept. 6....	"	....	127	1.97	8.10	251	....
Oct. 5....	"	....	148	2.23	8.50	330	....
Nov. 8....	"	....	1125	0.93	18.10	1047	....
Dec. 5....	"	....	1093	0.79	17.80	865	....
1913							
Jan. 9....	"	....	1072	0.63	17.40	675	....
Feb. 5....	"	....	1083	0.68	17.50	745	....
Mar. 10....	"	....	1030	0.62	17.00	639	....
Apr. 6....	"	....	1263	1.90	19.40	2403	....
May 6....	"	....	1074	1.04	17.60	1122	....
June 5....	Murray, W. S.	114	240	2.98	8.40	716	....
July 3....	"	115	187	1.98	8.70	353	....
Aug. 2....	"	108	145	1.35	8.00	211	....
Sept. 5....	"	93	132	1.46	8.40	193	....
Oct. 16....	"	96	146	1.78	8.50	210	....
Nov. 13	"	105	1110	0.77	17.97	862	....
Dec. 8....	"	105	1122	0.92	18.06	1035	....
1914							
Feb. 7....	"	....	91	4.37	12.60	398	....
Mar. 8....	"	40	178	2.67	11.80	475	....
Apr. 3....	"	51	282	4.88	14.20	1377	....
May 8....	"	35	358	8.14	14.80	2913	....
June 5....	"	35	243	7.02	13.50	1710	....
July 10....	"	35	146	2.42	13.40	356	....

(a) This station has been discontinued on account of backwater from dam in the town.

South River near Powassan

Location—At the highway bridge known as Gough's Bridge, 3 miles southwest of the Town of Powassan, Township of Himsworth, District of Parry Sound.

Records Available—Monthly discharge measurements, March, 1912, to July, 1914. Daily gauge heights, March 11 to Dec. 31, 1914.

Drainage Area—322 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches and located on the north-west corner of the left abutment. Zero on the gauge at elevation 24.00 was lowered to 23.00 feet on June 7, 1914. The gauge is referred to a bench mark (elevation 56.15) painted on a rock in the top corner of a barn foundation, about 350 feet from the bridge.

Channel—Straight for about 1,000 feet above and 200 feet below the station, at which point it turns to the right. The banks are low, fairly clean and liable to overflow at high stages. The bed of the stream consists of clay and boulders, and the current is moderate.

Discharge Measurements—Made from highway bridge at ordinary and high flows. During low stages of the river a wading section is used about 1 mile upstream. Measurements are made with a large Price current meter.

Control—About 5 miles below the station there is a dam used by the Nipissing Power plant, which may cause backwater at the gauge. Brush and debris in the stream affect the measurements.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge.

Observer—Owen Gough, Powassan, Ont.

Discharge Measurements of South River near Powassan in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Mar. 19....	Roberts, E	45	105	1.29	....	136	....
April 4....	"	50	173	1.34	....	231	....
June 7....	"	69	704	1.55	28.30	1091	....
July 4....	"	69	435	0.40	24.40	174	....
Aug. 5....	"	69	442	0.48	24.50	214	....
Sept. 7....	"	69	446	0.48	24.50	214	....
Oct. 7....	"	69	453	0.59	24.60	265	....
Nov. 9....	"	69	750	1.79	28.90	1346	....
Dec. 6....	"	69	743	1.70	28.80	1262	....
1913							
Jan. 10....	"	69	457	0.58	24.60	266	....
Feb. 6....	"	69	442	0.39	24.20	167	....
Mar. 11....	"	69	408	0.32	24.00	131	....
April 8....	"	69	836	2.41	30.20	2021	....
May 7....	"	35	676	1.42	27.80	962	....
June 6....	Murray, W. S..	69	552	1.07	26.00	592	....
July 4....	"	55	83	0.81	23.70	82	....
Aug. 4 (a)	"	52	66	1.05	23.90	69	....
Sept. 5....	"	53	70	1.37	23.80	96	....
Oct. 15 (a)	"	53	89	1.59	24.50	141	....
Nov. 14 (a)	"	70	553	0.93	26.00	514	....
Dec. 9 (a)	"	65	522	0.87	26.00	456	....
1914							
Jan. 9 (a)	"	66	430	0.27	24.71	117	....
Feb. 9 (b)	"	53	136	1.22	25.00	167	....
Mar. 10 (b)	"	45	106	1.45	24.42	155	....
April 3	"	70	733	1.83	28.92	1344	....
May 8 (c)	"	66	689	1.60	28.41	1103	....
June 6 (a)	"	66	464	0.65	25.00	303	....
July 10 {(a) (b)}	"	40	64	1.69	23.91	109	....

(a) Débris in stream (b) Wading section (c) Logs in stream

Daily Gauge Height and Discharge of South River near Powassan for 1914

Drainage Area 322 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	.....	.....	.....	.....	.....	.....	30.08	1965	30.75	2310	25.25	292
2	.....	.....	.....	.....	.....	.....	29.79	1810	30.08	1970	25.08	265
3	.....	.....	.....	.....	.....	.....	29.66	1745	29.42	1620	25.08	265
4	.....	.....	.....	.....	.....	.....	27.91	960	29.25	1495	25.00	254
5	.....	.....	.....	.....	.....	.....	27.00	660	29.04	1380	24.92	240
6	.....	.....	.....	.....	.....	.....	26.63	567	28.83	1290	25.08	265
7	.....	.....	.....	.....	.....	.....	26.31	495	28.63	1215	25.00	254
8	.....	.....	.....	.....	.....	.....	26.46	428	28.42	1140	24.92	240
9	.....	.....	.....	.....	.....	.....	26.83	615	28.29	1090	24.92	240
10	.....	.....	.....	.....	.....	.....	26.50	535	28.08	1030	24.83	228
11	.....	.....	.....	.....	24.5	185	26.63	567	28.00	1000	24.75	218
12	.....	.....	.....	.....	24.5	185	26.71	586	27.83	940	24.83	228
13	.....	.....	.....	.....	24.5	185	26.42	520	27.58	845	24.67	206
14	.....	.....	.....	.....	24.5	185	26.42	520	27.33	780	24.67	206
15	.....	.....	.....	.....	24.5	185	26.75	595	27.08	645	24.67	206
16	.....	.....	.....	.....	24.58	195	27.79	740	26.33	495	24.67	206
17	.....	.....	.....	.....	25.12	273	28.38	1140	26.42	520	24.67	206
18	.....	.....	.....	.....	25.0	254	29.96	1900	26.33	495	24.83	228
19	.....	.....	.....	.....	25.0	254	31.54	2720	25.92	410	24.58	195
20	.....	.....	.....	.....	25.0	254	33.50	3960	25.17	280	24.67	206
21	.....	.....	.....	.....	25.0	254	32.17	3080	25.68	265	24.50	185
22	.....	.....	.....	.....	25.0	254	31.00	2430	25.17	280	24.54	190
23	.....	.....	.....	.....	25.0	254	30.37	2120	25.50	335	24.46	180
24	.....	.....	.....	.....	25.0	254	29.88	1860	25.50	335	24.42	175
25	.....	.....	.....	.....	25.0	254	29.42	1620	25.42	322	24.42	175
26	.....	.....	.....	.....	25.87	400	29.63	1730	25.67	362	24.25	155
27	.....	.....	.....	.....	26.86	620	29.63	1730	25.58	350	24.00	125
28	.....	.....	.....	.....	26.96	650	29.37	1590	25.42	322	24.08	132
29	.....	.....	.....	.....	27.58	845	31.83	2900	25.25	292	25.37	312
30	.....	.....	.....	.....	27.91	960	31.96	2960	25.33	308	26.12	450
31	.....	.....	.....	.....	28.21	1070	.....	.....	25.33	308	.....	.....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	25.67	362	23.83	105	23.83	105	24.00	125	24.25	155	25.67	362
2	25.17	280	24.00	120	23.83	105	23.92	115	24.29	159	26.71	586
3	24.83	228	24.00	120	23.83	105	23.83	105	24.29	159	26.88	630
4	24.54	190	23.92	115	23.83	105	23.92	115	24.37	170	26.58	555
5	24.42	175	23.92	115	23.83	105	23.75	95	24.88	237	26.17	464
6	24.33	165	23.83	105	24.08	132	23.67	90	25.00	254	25.67	362
7	24.00	120	23.83	105	26.08	445	23.67	90	24.88	237	25.50	335
8	23.92	115	23.83	105	26.00	427	23.75	95	24.79	221	25.25	292
9	23.83	105	23.83	105	25.58	350	23.88	110	24.58	195	25.04	260
10	23.92	115	23.83	105	25.17	280	24.29	160	24.42	175	25.00	254
11	23.83	105	24.08	132	24.88	237	24.75	218	24.38	171	24.83	228
12	24.00	120	24.42	175	24.50	185	24.83	228	24.71	212	24.79	221
13	24.00	120	24.25	155	24.33	165	24.71	212	24.79	221	24.75	218
14	23.92	115	24.25	155	24.25	155	24.54	190	24.90	240	24.67	206
15	23.83	105	24.50	185	24.17	194	24.42	175	24.75	216	24.54	190
16	23.83	105	24.50	185	24.08	132	24.17	194	26.83	615	24.50	185
17	23.83	105	24.33	165	24.08	132	24.13	139	26.54	545	24.50	185
18	23.75	95	24.25	155	24.08	132	24.33	165	26.00	427	24.46	180
19	23.75	95	24.00	125	24.08	132	24.25	155	25.75	379	24.42	175
20	23.75	95	23.96	117	24.25	155	24.25	155	25.42	322	24.42	175
21	23.75	95	23.87	110	24.25	155	24.17	194	25.25	292	24.42	175
22	23.50	70	23.92	115	24.13	139	24.17	194	25.00	254	24.42	175
23	23.67	90	23.92	115	24.08	132	24.08	132	25.00	254	24.42	175
24	23.83	105	23.96	120	24.08	132	24.08	132	24.92	242	24.42	175
25	23.75	95	24.04	128	23.96	120	24.08	132	24.92	242	24.33	165
26	23.71	90	24.00	125	23.83	105	24.17	194	25.08	267	24.33	165
27	23.79	100	24.00	125	23.92	115	24.17	194	25.25	292	24.33	165
28	23.75	95	24.00	125	24.00	125	24.17	194	25.25	292	24.33	165
29	23.79	100	23.92	115	24.04	128	24.17	194	25.00	254	24.33	165
30	23.79	100	23.92	115	24.08	132	24.17	194	25.00	254	24.33	165
31	23.83	105	23.88	110	.....	.....	24.17	194	.....	.....	24.33	165

Monthly Discharge of South River near Powassan for 1914

Drainage Area 322 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	3,960	428	1,502	12.30	1.33	4.66	5.20
May	2,310	265	788	7.18	.82	2.45	2.82
June	450	125	224	1.40	.39	.696	.78
July	362	70	128	1.12	.22	.398	.46
August	185	105	127	.57	.33	.395	.45
September	445	105	169	1.38	.33	.525	.58
October	228	90	157	.71	.28	.488	.56
November	615	155	265	1.91	.48	.823	.91
December	630	165	255	1.96	.51	.793	.91
The period	3,960	70	400	12.30	.22	1.24	12.67

Sturgeon River near Smoky Falls

Location—At the highway bridge near Smoky Falls Post Office, and 2 miles above the Smoky Falls, Township of Springer, Nipissing District.

Records Available—Monthly discharge measurements, Aug., 1912, to July, 1914. Daily gauge heights, Jan. 12 to 31, 1914, and March 15 to Dec. 31, 1914.

Drainage Area—2,135 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and attached to a wooden pile on the right upstream side of the bridge. The zero on the gauge (elevation 32.00) is referred to a bench mark (elevation 53.47) painted on a rock on the right bank of the river, about 175 feet above the bridge.

Channel—Straight for about 700 feet above and 2 miles below the station. The banks are fairly high, clean, sandy and not liable to overflow. The bed of the stream is composed of clay and sand, slightly shifting. The current is fast and smooth, flowing through six channels, formed by the five bridge piers.

Discharge Measurements—Made from highway bridge with a large Price current meter.

Control—A dam is located at the falls, 2 miles below the station, which is used for log driving. This dam is closed only on Sundays, for a period of 2 or 3 months in the year.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge.

Observer—A. Pineault, Smoky Falls, Ont.

Discharge Measurements of Sturgeon River near Smoky Falls in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1912							
Aug. 5 (a)	Roberts. E	....	1722	1.08	33.80	1869	....
Sept. 9....	"	....	1621	0.95	33.30	1543	....
Oct. 8 (a)	"	....	1723	1.05	33.80	1800	....
Nov. 10....	"	....	1913	1.59	34.70	3042	....
Dec. 7....	"	....	1764	1.17	34.00	2060	....
1913							
Jan. 11....	"	....	1755	1.05	33.60	1843	....
Feb. 7....	"	....	1423	0.88	32.30	1259	....
Mar. 12....	"	....	1412	0.79	32.10	1121	....
April 19....	"	....	2185	2.39	36.00	5233	....
June 7....	Murray, W. S ..	210	2311	2.69	36.60	6129	....
July 6 (a)	"	193	2007	1.06	35.20	2135	....
Aug. 6....	"	210	1676	0.95	33.60	1594	....
Sept. 7 (a)	"	193	1578	0.54	33.20	856	....
Oct. 16....	"	193	1654	0.75	33.50	1148	....
Nov. 15....	"	210	2140	2.04	35.80	4195	....
Dec. 10....	"	210	2269	1.51	35.00	3642	....
1914							
Feb. 10....	"	....	1723	1.13	33.75	1960	....
Mar. 11....	"	193	1580	0.83	33.10	1313	....
April 4....	"	193	1675	1.02	33.58	1710	....
May 9....	"	193	2886	3.69	39.33	10616	....
June 7 (b)	"	210	2027	1.81	35.20	3683	....
July 11....	"	193	1717	1.12	33.83	1976	....

(a) Gauge height affected by backwater from closed dam
(b) Logs on control

Daily Gauge Height and Discharge of Sturgeon River near Smoky Falls for 1914

Drainage Area 2,135 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	.....	......	.....	......	.....	33.83	2180	39.91	11570	36.25	5520	34.00	2380	34.08	2500	33.00	1240	32.42	720	34.00	2380	34.00	2380
2	......	.....	......	.....	......	.....	33.75	2070	39.75	11310	36.08	5260	34.08	2500	34.33	2810	33.33	1590	32.75	1100	34.00	2380	34.33	2810
3	......	.....	......	.....	......	.....	33.66	1970	39.58	11030	35.83	4900	34.33	2810	34.25	2710	33.58	1860	33.00	1240	34.17	2600	34.58	3140
4	......	.....	......	.....	......	.....	33.58	1860	39.50	10900	35.67	4650	34.25	2710	34.17	2600	33.75	2070	33.17	1400	34.33	2810	34.58	3140
5	......	.....	......	.....	......	.....	33.50	1770	39.46	10810	35.42	4200	34.25	2710	34.00	2380	33.83	2180	33.17	1400	34.50	3025	34.45	2970
6	......	.....	......	.....	......	.....	33.42	1680	39.42	10750	35.33	4150	33.83	2180	34.25	2710	33.75	2070	33.25	1490	34.67	3250	34.33	2810
7	......	.....	......	.....	......	.....	33.33	1590	39.54	10950	35.17	3920	34.75	3350	34.00	2380	33.83	2180	33.42	1680	34.75	3350	34.25	2710
8	......	.....	......	.....	......	.....	33.33	1590	39.58	11030	35.08	3800	34.25	2710	33.67	1970	33.75	2070	33.42	1680	34.83	3460	34.17	2600
9	......	.....	......	.....	......	.....	33.42	1680	39.46	10810	35.00	3700	33.67	1970	33.67	1970	34.00	2380	33.50	1770	34.83	3460	34.08	2500
10	......	.....	......	.....	......	.....	33.42	1680	39.25	10560	34.92	3590	34.25	2710	33.50	1770	34.00	2380	33.58	1860	34.75	3350	34.00	2380
11	......	.....	......	.....	......	.....	33.50	1770	39.13	10400	34.83	3460	34.08	2500	33.58	1860	34.00	2380	33.67	1970	34.67	3250	33.92	2270
12	33.75	2070	......	.....	......	.....	33.58	1860	39.00	10160	34.75	3350	34.08	2500	34.17	2600	33.92	2270	33.67	1970	34.67	3250	33.83	2180
13	33.75	2070	......	.....	......	.....	33.50	1770	38.71	9650	34.83	3460	33.67	1970	33.83	2180	33.75	2070	33.75	2070	34.58	3140	33.83	2180
14	33.75	2070	......	.....	......	.....	33.58	1860	38.46	9210	35.08	3800	34.67	3250	33.42	1680	33.42	1680	33.00	1240	34.33	2810	33.75	2070
15	33.75	2070	......	.....	33.25	1490	33.75	2070	38.29	8950	34.67	3250	34.75	3350	33.33	1590	33.58	1860	33.83	2180	34.42	2925	33.75	2070
16	33.83	2180	......	.....	33.25	1490	33.83	2180	38.09	8600	34.58	3140	34.67	3250	33.25	1490	33.58	1860	33.92	2270	34.83	3460	33.67	1970
17	33.75	2070	......	.....	33.25	1490	34.13	2550	37.83	8270	34.33	2810	34.75	3350	33.33	1590	33.75	2070	34.00	2380	34.67	3250	33.58	1860
18	33.75	2070	......	.....	33.25	1490	34.33	2810	37.67	8000	34.33	2810	34.67	3250	33.58	1860	33.92	2270	34.08	2500	34.00	2380	33.50	1770
19	33.66	1970	......	.....	33.25	1490	35.13	3880	37.50	7650	34.25	2710	34.75	3350	33.67	1970	33.83	2180	34.17	2600	34.00	2380	33.42	1680
20	33.75	2070	......	.....	33.16	1400	35.42	4250	37.25	7200	34.25	2710	34.67	3250	33.75	2070	33.75	2070	34.25	2710	34.00	2380	34.00	2380
21	33.66	1970	......	.....	33.25	1490	35.21	3980	37.00	6750	34.08	2500	34.33	2810	34.17	2600	33.67	1970	34.25	2710	34.00	2380	34.00	2380
22	33.66	1970	......	.....	33.16	1400	35.33	4150	36.83	6480	34.00	2380	34.33	2810	33.67	1970	33.58	1860	34.25	2710	34.88	3530	34.00	2380
23	33.66	1970	......	.....	33.16	1400	35.38	4200	36.67	6170	34.00	2380	34.42	2925	33.50	1770	33.42	1680	34.17	2600	34.00	2380	33.92	2270
24	33.66	1970	......	.....	33.16	1400	35.58	4500	36.42	5780	34.08	2500	34.42	2925	33.25	1490	33.25	1490	34.08	2500	34.00	2380	33.83	2180
25	33.66	1970	......	.....	33.16	1400	35.75	4770	36.25	5530	34.00	2380	34.42	2925	33.17	1400	33.08	1320	34.17	2600	33.92	2270	33.75	2070
26	33.66	1970	......	.....	33.25	1490	36.71	6250	36.17	5400	34.00	2380	34.42	2925	33.00	1240	33.00	1240	34.17	2600	33.92	2270	33.67	1970
27	33.66	1970	......	.....	33.25	1490	37.71	7950	36.17	5400	33.83	2180	34.33	2810	33.00	1240	33.00	1240	34.17	2600	34.00	2380	33.75	2070
28	33.66	1970	......	.....	33.25	1490	38.00	8430	36.17	5400	33.92	2270	34.25	2710	32.92	1150	32.92	1150	34.08	2500	33.92	2270	33.67	1970
29	33.66	1970	......	.....	33.33	1580	39.00	10160	36.17	5400	34.08	2500	34.17	2600	32.92	1150	32.67	940	34.08	2500	33.92	2270	33.75	2070
30	33.66	1970	......	.....	33.58	1860	39.58	11100	36.42	5780	34.08	2500	34.50	3025	32.92	1150	32.42	720	34.08	2500	33.83	2180	33.75	2070
31	33.66	1970	......	.....	33.75	2070	......	.....	36.42	5780	......	.....	36.67	3250	32.92	1150	......	.....	34.00	2380	......	.....	33.67	1970

Monthly Discharge of Sturgeon River near Smoky Falls for 1914

Drainage Area 2,135 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	11,100	1,590	3,618	5.20	.74	1.69	1.89
May	11,570	5,400	8,441	5.42	2.53	3.95	4.55
June	5,520	2,180	3,305	2.59	1.02	1.55	1.73
July	3,350	1,970	2,831	1.57	.92	1.325	1.52
August	2,810	1,150	1,903	1.32	.54	.891	1.03
September	2,380	720	1,811	1.11	.34	.847	.95
October	2,710	720	2,078	1.27	.34	.973	1.12
November	3,530	2,180	2,787	1.65	1.02	1.305	1.45
December	3,140	1,680	2,299	1.47	.79	1.077	1.25
The period	11,570	720	3,236	5.42	.34	1.516	15.49

Wahnapitae River near Wahnapitae

Location—At the falls known as Timmins Chute, 6 miles above the village of Wahnapitae. The old cross-section was located on the C. P. Ry. bridge, in the Village of Wahnapitae, 2 miles above the Wahnapitae Power Plant, Township of Dryden, Sudbury District.

Records Available—Monthly discharge measurements, Aug., 1912, to Nov., 1914.

Drainage Area—910 square miles.

Gauge—A bench mark gauge (elevation 30.00) is located on a prominent rock at the edge of the falls, on the right bank of the river, and is distinguished by a painted arrow point.

Channel—Straight for about 500 feet above and 100 feet below to a 14-foot fall. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay and gravel, which is slightly shifting. The current is fast, and flows through one channel at all stages of the river.

Discharge Measurements—Made from a boat with a large Price current meter.

Winter Flow—The river is covered with ice during the winter months, and measurements are made through the ice to determine the winter discharge.

Discharge Measurements of Wahnapitae River near Wahnapitae in 1912-3-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1906							
Jan. 23....	....	....	....	....	....	826	0.91
1912							
Aug. 7....	Roberts, E......	....	2060	0.88	32.00	1807	1.98
Sept. 10....	"	....	2090	0.95	32.20	1983	2.18
Oct. 9....	"	....	2060	0.87	32.00	1794	1.97
Nov. 11....	"	....	2115	0.91	32.40	1908	2.10
Dec. 9....	"	....	2075	0.91	32.10	1887	2.08
1913							
Jan. 12....	"	149	2060	0.86	32.00	1776	1.95
Feb. 9....	"	149	1911	0.69	31.00	1329	1.46
Mar. 13....	"	149	1951	0.79	31.20	1553	1.71
May 8....	"	149	2462	2.12	34.70	5239	5.75
June 9....	Murray, W. S...	149	2140	1.36	32.10	2915	3.20
July 5....	" ...	149	2135	0.65	32.50	1408	1.55
Aug. 11....	" ...	149	2118	0.47	32.40	981	1.08
Sept. 6....	" ...	149	2149	0.55	32.70	1200	1.32
Oct. 17....	" ...	149	2097	0.45	32.20	977	1.06
Nov. 17....	" ...	149	2097	0.82	32.20	1725	1.90
Dec. 11....	" ...	149	2131	0.47	32.10	920	1.01
1914							
Jan. 12....	" ...	149	2047	0.21	32.00	544	0.60
Mar. 12 (a)	" ...	50	160	6.14	25.12	985	1.08
May 11....	" ...	....	2216	1.56	27.71	3456	3.80
June 8....	" ...	149	1195	3.37	28.07	4025	4.42
July 13....	" ...	125	786	1.57	27.07	1237	1.36
Aug. 13....	" ...	115	682	1.33	26.10	909	1.00
Sept. 14....	" ...	110	655	1.08	25.80	711	0.78
Oct. 9....	" ...	111	675	1.12	25.70	753	0.82
Nov. 7....	" ...	112	658	1.06	25.60	698	0.77

(a) New section established. The measurement at the old section affected by backwater from dam at Wahnapitae Power Plant.

Vermilion River near White Fish

Location—At the old highway bridge, 50 feet above the rapids; 300 feet north of the C. P. Ry. Bridge, and 2 miles east of the Town of White Fish, Township of Graham, Sudbury District.

Records Available—Monthly discharge measurements, Aug., 1913, to July, 1914.

Drainage Area—1,900 square miles.

Gauge—A bench mark gauge (elevation 40.00) located on the downstream side of a wooden stringer on the bridge, 70 feet from the right abutment. It is referred to a bench mark (elevation 38.39) painted on a rock on the right bank, 12 feet from the right abutment of the highway bridge.

Channel—Straight for about 300 feet above and 700 feet below the station. Both banks are high, rocky and wooded, not liable to overflow. The bed of the stream is rocky and permanent. The current is swift, two channels existing at all stages, on account of the centre pier of the bridge.

Discharge Measurements—Made from the highway bridge with a large Price current meter.

Control—Log jams sometimes occur on the rapids during low flows, which cause backwater at the station.

Winter Flow—On account of the swift current, the channel remains open during the winter months, ice sometimes forming at the banks.

Discharge Measurements of Vermilion River near White Fish in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
Aug. 7....	Murray, W. S...	183	708	1.09	27.40	773	0.41
Sept. 8....	"	180	614	0.59	26.80	325	0.17
Oct. 18....	"	180	675	0.82	27.20	559	0.29
Nov. 18....	"	186	978	1.98	29.00	2014	1.06
Dec. 12....	"	188	887	2.13	28.50	1888	0.99
1914							
Jan. 13....	"	180	690	0.85	27.30	586	0.31
Feb. 12....	"	188	677	0.74	27.20	501	0.26
April 6....	"	188	825	1.67	28.17	1379	0.73
May 12....	"	205	1468	4.79	31.50	7027	3.70
June 9....	"	200	1287	3.74	30.50	4814	2.53
July 14....	"	160	780	1.47	27.85	1147	0.60

Spanish River at Espanola

Location.—At the highway bridge, about 200 yards below the falls and about the same distance below the Spanish River Pulp and Paper Mill, in the Town of Espanola, Township of Merrit, Sudbury District.

Records Available.—Monthly discharge measurements, March to Dec., 1914.

Drainage Area.—6,949 square miles.

Gauge.—A bench mark gauge (elevation 50.00) painted on the bottom chord of the bridge, on the downstream side, 5 feet to the right of the centre pier.

Channel.—Above the station, the water from the falls and power-house flows into a pool about 700 feet wide and then narrows down to 220 feet at the bridge, thence flowing straight for about 1,000 feet. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay and boulders, practically permanent. The current is fast, one channel existing at low stages. At high stages the stream flows through two channels, separated by the centre pier of the bridge.

Discharge Measurements.—Made from the highway bridge with a large Price current meter.

Control.—The Spanish River Pulp and Paper plant, 200 yards above, uses all the water coming down the river during the summer, discharging through the tail race and past the section. The river is used throughout the spring and summer for log driving.

Winter Flow.—Ice forms about 1 mile below the station, but remains open at the section during the entire year.

Discharge Measurements of Spanish River at Espanola in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Mar. 13....	Murray, W. S...	200	1620	1.52	21.90	2470	.36
April 7....	" ...	222	2867	1.53	23.50	4377	.63
May 13....	" ...	222	4736	3.85	31.09	18210	2.62
June 9....	" ...	231	3492	2.22	25.80	7768	1.12
July 14....	" ...	210	2761	1.23	23.00	3396	.49
Aug. 14....	" ...	210	2530	0.58	21.90	1484	.21
Sept. 15 (a)	" ...	225	2521	0.76	21.85	1923	.28
Oct. 10....	" ...	215	2381	0.81	21.17	1929	.28
Nov. 9....	" ...	211	2610	1.28	22.33	3153	.45
Dec. 10....	" ...	220	2880	1.43	23.58	4126	.59

(a) Log jam

Mississagi River at Mississagi

Location.—At the C. P. Ry. Bridge, near Mississagi Flag Station, Mississagi Indian Reserve, four miles west of the Town of Blind River, Township of Cobden, Algoma District.

Records Available.—Monthly discharge measurements, July 1913, to Dec., 1914.

Drainage Area.—3,522 square miles.

Gauge.—The elevation of the surface of the water is ascertained by means of a level, from a bench mark (elev. 20.00) established on a rock, on the left bank of the river, 600 feet above the bridge and 100 feet above the rapids.

Channel.—Straight for about 400 feet above and 2,000 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of rock and is permanent. The current is swift, flowing through one channel at low stages and two channels during high water periods.

Discharge Measurements.—Made from the railway bridge with a large Price current meter.

Control.—Wind levels from Lake Huron cause backwater at this station.

Winter Flow.—The river is covered with ice during the winter months, and measurements are made through the ice to determine the winter discharge.

Discharge Measurements of Mississagi River at Mississagi (a) in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 7....	Murray, W.	202	2004	2.18	29.50	4395	1.24
Aug. 9....	"	192	2010	1.64	29.40	3343	0.95
Sept. 9....	"	145	1951	0.65	28.90	1282	0.36
Oct. 20....	"	140	1843	1.29	28.40	2526	0.72
Nov. 19....	"	142	1889	1.90	28.50	3707	1.05
1914							
Jan. 14....	"	142	1843	0.60	28.20	1109	0.31
Feb. 13....	"	140	1785	1.27	28.00	2302	0.65
Mar. 13....	"	....	1785	1.31	12.35	2361	0.67
May 13....	"	....	2302	8.14	18.92	18733	5.31
June 9....	"	....	1976	3.15	15.42	6226	1.77
July 14....	"	140	1907	1.72	14.21	3282	0.93
Aug. 14....	"	140	1884	0.82	12.07	1549	0.44
Sept. 15....	"	142	1831	0.95	12.57	1741	0.49
Oct. 10....	"	140	1802	0.70	11.87	1299	0.37
Nov. 9....	"	142	1878	1.41	13.02	2645	0.75
Dec. 10....	"	140	1723	1.34	11.67	2306	0.65

(a) This station is seriously affected by wind levels on Lake Huron, which cause backwater at point of measurement.

Montreal River at Latchford

Location.—At the Temiskaming and Northern Ontario Railway Bridge, 300 feet below the Government Dam, in the Town of Latchford, Township of Coleman, Temiskaming District.

Records Available.—Monthly discharge measurements, August to December, 1914. Daily gauge heights, April 1st to Dec. 31st, 1914.

Drainage Area.—Not measured.

Gauge.—Vertical steel staff, located on the left downstream side of the Government Dam. This is a Dominion Government gauge graduated to feet and hundredths. The zero on the gauge (elev. 892.43) is referred to a bench mark (elev. 912.42) which is painted with red paint near the centre of the dam.

Channel.—Straight for about 300 feet above and 300 feet below the station. The banks are high, rocky, and will not overflow. The bed is composed of sand and rock, slightly shifting. The river is fast and flows through two channels at low stages and three channels during high water periods.

Discharge Measurements.—Made from the downstream side of the bridge with a large Price current meter.

Control.—The operation of the Government Dam above causes fluctuations at the section and interferes with the natural flow of the river.

Winter Flow.—The river is open at the station during the winter months, but frozen above the dam and below the section.

Accuracy.—As only a few discharge measurements were made since establishment of the station, there are not sufficient data to compute the daily discharges. Tables will be prepared as soon as sufficient records are available.

Observer.—Geo. Schneider, Latchford, Ontario.

Discharge Measurements of Montreal River at Latchford in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
Aug. 10....	Murray, W.S...	210	310	5.96	....	1846	....
Sept. 11....	"	207	270	6.03	....	1627	....
Oct. 7....	"	180	220	4.58	....	1009	....
Nov. 4....	"	208	237	4.01	....	951	....
Dec. 7....	"	237	252	2.53	....	638	....

Blanche River near Englehart

Location.—At the highway bridge near the High Falls, 3½ miles northwest of the Town of Englehart, Township of Evanturel, Temiskaming District.

Records Available.—Monthly discharge measurements, Aug. to Dec., 1914. Daily gauge heights, Oct. 8th to Dec. 31st, 1914.

Drainage Area.—230 square miles.

Gauge.—Vertical steel staff with enamelled face, graduated in feet and inches, and located on the southwest corner of the wing wall of the bridge. The zero on the gauge (elev. 10.00) is referred to a bench mark (elev. 23.29), painted on a prominent rock on the right bank, 75 feet below the bridge.

Channel.—At a point 200 feet above the station, the river curves from the right and then flows straight up to a point 700 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay, practically permanent. The current is very slow, flowing through 2 channels at low stages and 3 channels during high water periods.

Discharge Measurements.—Made from the highway bridge with a large Price current meter.

Control.—A temporary dam is built above the station during the summer months. This dam is used for storing water during the period when the river is used for log driving. The gauge heights at the section are therefore affected during the storage and log driving periods.

Winter Flow.—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge.

Accuracy.—As only a few discharge measurements were made since establishment of the station, there are not sufficient data to compute the daily discharges. Tables of daily gauge heights, daily discharges and monthly discharges will be prepared as soon as sufficient records are available.

Observer.—W. Antram, Englehart, Ont.

Discharge Measurements of Blanche River near Englehart in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Aug. 12....	Murray, W. S ..	98	711	0.42	11.58	303	....
Sept. 13....	" ..	103	685	0.27	11.07	197	....
Oct. 8 (a)	" ..	96	637	0.18	10.29	112	....
Nov. 6....	" ..	94	668	0.20	10.92	134	....
Dec. 9 (b)	" ..	60	570	0.15	10.75	87	....

(a) Low water reading unreliable. A wading section will be located for low water measurements

(b) Ice measurements, taken 150 ft. below gauge.

Frederickhouse River at Frederickhouse

Location—Midway between the highway bridge and railway bridge, 6 miles northwest of Cochrane, or 1½ miles south of the G. T. Pacific Ry. Bridge, in the Town of Frederickhouse, Township of Clute, Temiskaming District.

Records Available—Monthly discharge measurements, April, Aug., Sept., and Nov., 1914.

Drainage Area—1,252 square miles.

Gauge—A bench mark gauge (elev. 20.00) painted on a rock located on the left bank of the river at the section.

Channel—Straight for about 1 mile above and 400 yards below the station. The banks are very high, thickly wooded, and will not overflow. The bed of the stream is composed of clay and boulders, slightly shifting. The current is very swift, flowing through one channel at all stages.

Discharge Measurements—Made by wading with a large Price current meter.

Control—An old broken dam is located about 100 feet above the station, which interferes with the measurements.

Accuracy—Only 2 measurements were made at this new station, but are not very reliable on account of the broken dam and slush ice existing at the section.

Discharge Measurements of Frederickhouse River at Frederickhouse in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
April 4....	McLennan, C. C.	55	194.1	1.37	....	266	.21
Aug. 11....	Murray, W. S...	160	201.0	1.50	13.50	302	.24
Sept. 12 (a)	"	53	73.5	.52	15.05	39	.03
Nov. 5....	"	50	93.3	6.81	17.80	635	.51

(a) New section established

Seine River at Skunk Rapids

Location—About 200 feet above Skunk Rapids, and 1 mile upstream from the Canadian Northern Ry. bridge. One-half mile north of the C. N. Ry. tracks, and 1 mile west of La Seine Station, in the District of Rainy River.

Records Available—Discharge measurements, Aug. to Dec., 1914. Daily gauge heights, Sept. 22 to Dec. 31, 1914.

Drainage Area—3,483 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and located near La Seine station, on the C. N. Ry. The zero on the gauge is at an elevation of 87.73 feet, which is referred to a bench mark (assumed elevation 100.00) painted on a large boulder, on the right bank of the river, 6 feet from a 6-inch poplar tree used as a final point for soundings. The initial point is on the left bank and consists of a 2-inch spruce tree, blazed and marked I.P. with white paint. "H. E. P. Comm." is painted on the rock directly below the spruce tree.

Channel—Straight for about 500 feet above and 200 feet below the station to the rapids. The right bank of the river curves into a point at the rapids forming a narrow channel. The velocity of the river is slow and the banks are high, rocky and wooded. This land has been burnt over, but most of the trees are still standing. The bed of the stream is sandy and clean, with a few boulders near the right bank. One channel exists at all stages.

Discharge Measurements—Made from canoe by means of a Price small current meter.

Accuracy—As only a few discharge measurements were made up to the present time, there are not sufficient discharge measurements to make accurate estimates of the daily discharge. Tables of daily gauge height, daily discharge and monthly discharge will be prepared when records are available.

Observer—C. Rose, La Seine, Ont.; P.O., Banning, Ont.

Discharge Measurements of Seine River at Skunk Rapids in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Aug. 14....	Taylor, J. R.....	194.9	2000	.66	8.84	1329	....
Sept. 22....	"	199.4	2079	.804	9.33	1674	....
Oct. 13....	"	198.5	2061	.73	9.15	1522	....
Nov. 10....	"	195.4	2000	.642	8.88	1284	....
Dec. 5 (a)	"	185	1849	.57	8.25	1059	....

(a) Boat and ice measurement. River partly frozen.

Daily Gauge Height and Discharge of Seine River at Skunk Rapids for 1914

Drainage Area, 3,483 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.08	1,460	8.92	1,320	...	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.08	1,460	8.90	1,302	...	...
3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.92	1,320	...	...
4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.91	1,311	...	...
5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.90	1,302	...	...
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.90	1,302	...	...
7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.90	1,302	...	...
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.04	1,425	8.90	1,302	...	...
9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.04	1,425	8.90	1,302	...	...
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.06	1,442	8.88	1,285	...	...
11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.13	1,503	8.85	1,260	...	...
12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.13	1,503	8.83	1,240	...	...
13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.15	1,520	8.85	1,260	...	...
14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.15	1,520	8.85	1,260	...	...
15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.13	1,503	8.85	1,260	...	...
16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.11	1,485	8.84	1,250	...	...
17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.09	1,469	3.78	1,198	...	...
18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.07	1,450	8.77	1,190	...	...
19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.03	1,415	8.77	1,190	...	...
20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.00	1,390	8.75	1,171	...	...
21	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8.98	1,372	8.74	1,162	...	...
22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.33	1,675	8.97	1,362	8.73	1,154	...	...
23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.27	1,625	9.03	1,415	8.73	1,154	...	...
24	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.26	1,616	9.04	1,425	8.71	1,138	...	...
25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.27	1,625	9.04	1,425	8.70	1,130	...	...
26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.20	1,562	9.02	1,407	8.69	1,121	...	...
27	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.17	1,537	9.00	1,390	8.67	1,104	...	...
28	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.16	1,530	8.98	1,372	8.67	1,104	...	...
29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.11	1,485	8.96	1,352	8.67	1,104	...	...
30	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	9.08	1,460	8.95	1,345	8.67	1,104	...	...
31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8.94	1,337	...	...	...	...

Monthly Discharge of Seine River at Skunk Rapids for 1914

Drainage Area, 3,483 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum.	Mean.	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	1,520	1,337	1,431	0.44	0.38	0.411	0.47
November	1,320	1,104	1,220	0.38	0.32	0.350	0.39
December	....	....	....	....	....	....	....
The period	....	....	....	....	....	....	....

Turtle River at Mountain Rapids

Location—About 300 feet above Mountain Rapids, and about 8 miles from the Olive Mine. 12 miles from Mine Centre, which is on the C. N. Ry., in the Rainy River District.

Records Available—Monthly discharge measurements, Aug. to Dec., 1914. Daily gauge heights, Aug. 9 to Dec. 31, 1914.

Drainage Area—1,841 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and fastened on a crib pier at the C. N. Ry. saw mill, 12 miles from the station. The gauge is located 1,000 feet south of the mouth of Little Turtle River, on the east shore of Little Turtle Lake. Zero on gauge (elevation 83.89) is referred to a bench mark established on a rock with white paint, on the left bank of the river, four feet south of a blazed pine tree, marked I.P. with white paint, which is used as the initial point for soundings. The elevation of this bench mark is 96.00, which is referred to another bench mark (assumed elevation 100.00) established on a rock with white paint, 35 feet north-east of the gauge, at the C. N. Ry. Mill at Mine Centre.

Channel—Straight for about 1,000 feet above and below the station, the water running slowly. The banks are high, wooded and rocky. The bed of the stream is sandy and clean, one channel existing at all stages.

Discharge Measurements—Made from a canoe with a small Price current meter.

Control—The river is used extensively for log driving, and the log jams in Otter Falls affect the section somewhat.

Accuracy—As only a few discharge measurements were made up to the present time, there are not sufficient data to make accurate computations of the daily discharge. Additional tables of daily gauge height, daily discharge and monthly discharge will be prepared and published when sufficient records are available.

Observer—W. R. Miller, Mine Centre, Ontario.

Discharge Measurements of Turtle River at Mountain Rapids in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Aug. 11....	Taylor, J. R.....	168.4	2947	.29	92.47	850	....
Sept. 23....	"	167.8	2948	.407	92.43	1202	....
Oct. 12....	"	169.1	3033	.412	92.93	1250	....
Nov. 5....	"	168.1	2964	.39	92.58	1161	....
Dec. 19 (a).	"	161.0	2518	.089	90.39	224	....

(a) Ice measurement—jam at Otter Falls.

Manitou River at Devil's Cascades

Location—About 150 feet below the old dam, at the head of the Devil's Cascades, Rainy River District.

Records Available—Monthly discharge measurements, July to Dec., 1914. Daily gauge heights, July 15 to Nov. 31, 1914.

Drainage Area—440 square miles.

Gauge—An inclined steel staff, graduated in feet and inches, and located on the face of the old dam. The zero of the gauge is at an elevation of 139.38 feet referred to a bench mark (elevation 147.37) painted on a rock, 1 foot east of the initial point of soundings. Owing to the gauge not being vertical in the face plane, .03 feet per foot of staff reading is to be subtracted from the staff reading before adding to gauge zero for water levels.

Channel—Straight for about 150 feet above and 400 feet below the station. The right bank is high, rocky, wooded, and not liable to overflow, but the left bank is low and wooded, with a gradually rising bank, which is not liable to overflow unless the dam is operated. The bed of the stream is composed of rock, and the current is slow, one channel existing at all stages.

Discharge Measurements—Made from canoe or ice, by a small Price current meter.

Control—Several dams exist on the river between the section and Manitou Lake, which are not in operation at present. The operation of the dam just above the station causes fluctuations at the gauge.

Accuracy—As only a few discharge measurements were made, there are not sufficient data to make accurate computations of the daily discharge. Table of daily gauge height, daily discharge and monthly discharge will be prepared when sufficient records are available.

Observer—S. H. Baldwin, Box No. 250, Fort Francis, Ontario.

Discharge Measurements of Manitou River at Devil's Cascades in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
July 15....	McLennan, C. C..	110	494	.577	4.83	284	....
Aug. 13....	Taylor, J. R.....	98.6	483	.56	4.69	271	....
Sept. 19....	"	99.8	455	.47	4.40	214	....
Oct. 11....	"	98.7	463	.506	4.52	234	....
Nov. 3....	"	98.5	454	.48	4.45	219	....
Dec. 17....	"	94.3	474	.43	4.35	194	....

Daily Gauge Height and Discharge of Manitou River at Devil's Cascades for 1914

Drainage Area, 440 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.81	287	4.50	230	4.44	220	4.44	220	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.79	283	4.50	230	4.42	220	4.44	220	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.77	279	4.42	216	4.42	220	4.44	220	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.75	276	4.37	207	4.40	212	4.42	216	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.73	272	4.35	203	4.40	212	4.42	216	.....	.....
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.73	272	4.35	203	4.40	212	4.42	216	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	268	4.37	207	4.42	216	4.40	212	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	268	4.37	207	4.44	220	4.35	203	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	268	4.35	203	4.46	224	4.35	203	.....	.....
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	268	4.35	203	4.48	227	4.33	199	.....	.....
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	268	4.33	199	4.50	230	4.35	203	.....	.....
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.69	264	4.35	203	4.50	230	4.38	208	.....	.....
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.69	264	4.37	207	4.50	230	4.42	216	.....	.....
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.67	261	4.37	207	4.50	230	4.46	224	.....	.....
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.87	298	4.67	261	4.35	203	4.48	227	4.50	230	.....	.....
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.87	298	4.65	257	4.35	203	4.48	227	4.50	230	.....	.....
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.92	307	4.65	257	4.37	207	4.46	224	4.50	230	.....	.....
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.94	310	4.65	257	4.37	207	4.46	224	4.50	230	.....	.....
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.94	310	4.62	252	4.40	212	4.48	227	4.50	230	.....	.....
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.00	321	4.62	252	4.40	212	4.48	227	4.50	230	.....	.....
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.04	329	4.62	252	4.39	210	4.50	230	4.50	230	.....	.....
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.04	329	4.60	248	4.42	216	4.50	230	4.50	230	.....	.....
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.00	321	4.60	248	4.42	216	4.50	230	4.48	227	.....	.....
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.98	318	4.60	248	4.44	220	4.50	230	4.48	227	.....	.....
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.98	318	4.60	248	4.44	220	4.50	230	4.48	227	.....	.....
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.98	318	4.60	248	4.44	220	4.50	230	4.48	227	.....	.....
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.96	314	4.60	248	4.44	220	4.48	227	4.50	230	.....	.....
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.92	307	4.58	245	4.48	226	4.46	224	4.50	230	.....	.....
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.90	303	4.56	241	4.48	226	4.46	224	4.50	230	.....	.....
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.87	298	4.54	238	4.46	224	4.44	224	4.50	230	.....	.....
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.85	294	4.52	234	.....	.....	4.44	220	.....	.....	.....	.....

Monthly Discharge of Manitou River at Devil's Cascades for 1914

Drainage Area, 440 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Me	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	287	234	259	0.65	0.53	0.588	0.68
September	230	199	212	0.52	0.45	0.482	0.54
October	230	212	224	0.52	0.48	0.511	0.59
November	230	199	222	0.52	0.45	0.503	0.56
December	....	....	....	....	....	....	....
The period	287	199	231	.65	.45	0.52	2.37

Footprint River at Rainy Lake Falls

Location—100 feet above the crest of the lowest fall, at the mouth of the Footprint River where it flows into the north-west bay of Rainy Lake, on Indian Reserve 17A, District of Rainy River.

Records Available—Monthly discharge measurements, July to Dec., 1914. Daily gauge heights, Sept. 18 to Dec. 31, 1914.

Drainage Area—588 square miles.

Gauge—Vertical steel staff gauge, graduated in feet and in inches, and attached to a poplar tree 26.2 feet from the initial point. The zero on the gauge (elevation 102.26) is referred to a bench mark painted on the ledge of a rock on right bank 6.7 feet upstream from initial point for soundings. Rod held on dot inside of circle marked B.M. in white paint (elevation 110.51).

Channel—About 40 feet above the station the channel curves to the left and then runs straight for about 140 feet, dropping into Rainy Lake. The banks are high, rocky, wooded, and not liable to overflow. The right bank has been burnt over. The bed of the river contains large boulders, and one channel exists at all stages.

Discharge Measurements—Made from canoe with small Price current meter. The initial point for soundings is marked Initial Point, H. E. P. C. on a rock ledge on the right bank, and 4.75 feet downstream from the point marked Initial Point, P. W. D., and 6.7 feet from the bench mark.

Control—Occasional operations of the dam at Footprint Lake cause fluctuations in the river at the gauge.

Accuracy—As only a few discharge measurements were made up to the present time, there are not sufficient data to make accurate computations of the daily discharge. Tables of daily gauge height, daily discharge, and monthly discharge will be prepared when sufficient records are available.

Observer—John Lyons, Fort Frances P. O.

Discharge Measurements of Footprint River at Rainy Lake Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
July 14....	McLennan, C. C..	65.7	165	4.11	103.49	681	....
Aug. 12....	Taylor, J. R.....	61	130	2.72	102.86	356	....
Sept. 18....	"	54.3	101	2.38	102.38	242	....
Oct. 10....	"	54.3	101	2.34	102.36	238	....
Nov. 1....	"	45.9	57	1.83	101.47	105	....
Dec. 17....	"	48.2	67	1.74	101.70	118	....

Daily Gauge Height and Discharge of Footprint River at Rainy Lake Falls for 1914

Drainage Area. 588 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	101.47	106	......	......
2	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	101.45	102	......	......
3	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	101.45	102	......	......
4	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
5	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
6	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
7	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
8	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
9	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
10	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
11	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
12	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.35	235	101.45	102	......	......
13	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
14	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
15	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
16	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
17	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	101.45	102	......	......
18	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	101.45	102	......	......
19	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	101.45	102	......	......
20	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.34	233	102.36	238	101.45	102	......	......
21	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.34	233	102.36	238	101.45	102	......	......
22	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	101.45	102	......	......
23	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
24	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
25	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
26	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
27	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.34	233	102.36	238	105.68	102	......	......
28	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
29	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
30	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.38	242	102.36	238	105.68	102	......	......
31	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	102.36	238	......	......	......	......

Monthly Discharge of Footprint River at Rainy Lake Falls for 1914

Drainage Area 588, Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	242	238	238	0.41	0.40	0.405	.46
October	106	102	102	0.18	0.17	0.173	.19
November	....	....	....	....	....	....	....
December	....	....	....	....	....	....	....
The period	....	....	....	....	....	....	....

Wabigoon River at Wabigoon Falls

Location—About 100 feet below the lowest fall on the Wabigoon River, and 3 miles from the mouth of the Wabigoon River discharging into the English River, District of Kenora.

Records Available—Monthly discharge measurements, June to Nov., 1914.

Drainage Area—1,026 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches and screwed to a 5-inch hewn spruce post, firmly wedged and braced to the left bank, about 200 feet above the metering station. The zero on the gauge (elevation 111.37) is referred to a bench mark (elevation 120.07) on a nail driven in a 4-inch tamarac stump located 2 feet upstream from the gauge. The initial point for soundings is on the right bank, painted I.P., S. 12° E on a blazed 5-inch poplar tree.

Channel—Straight for about ½ mile above and 100 feet below the station to the falls. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of rock, with a few boulders and weeds at the right bank. The current is sluggish above the station, but swift just above the falls. There is a slight backwater at the left bank.

Discharge Measurements—Made from canoe and ice with a small Price current meter.

Discharge Measurements of Wabigoon River at Wabigoon Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1914							
June 8....	McLennan, C. C.	248	3658	.91	114.88	3312	....
July 17....	"	247.6	3458	.74	114.05	2569	....
Aug. 4....	"	246	3220	.54	113.04	1732	....
Sept. 14....	"	217	2957	.37	112.04	1103	....
Nov. 8....	"	239.5	3081	.44	112.52	1374	....
Dec. 21....	"	217	2907	.30	111.73	900	....

Wabigoon River near Quibell

Location.—About 200 feet above the second fall from the G. T. P. Ry. bridge which spans the first fall, or ½ mile north of the railway. One-half mile from Quibell station on the Grand Trunk Pacific Railway, Quibell Township, District of Kenora.

Records Available.—Monthly discharge measurements, June to Nov., 1914. Daily gauge heights, Aug. 1 to Nov. 30, 1914.

Drainage Area.—1,612 square miles.

Gauge.—Vertical staff gauge consisting of 9 feet of enamelled steel plate, graduated in feet and inches and screwed to a 5-inch hewn spruce post, firmly wedged and secured to a rock on the right bank of the river. The elevation of the zero mark is 24.26, which is referred to a bench mark (elevation 33.67) located just below the gauge.

Channel.—Straight for about 1,200 feet above the station, where the stream enters from the right bank, making an angle of 90°. For about 200 feet below the station the river is straight and then narrows into a fall. The water is sluggish, and banks are high, rocky and wooded. There are a few boulders apparent in the bed of the stream. One channel exists at all stages.

Discharge Measurements.—Made from a canoe by a small Price current meter.

Control.—The Dryden Timber and Power Co. operate a dam and power plant at Dryden, on the Wabigoon River.

Accuracy—As only a few discharge measurements are made up to the present time, there are not sufficient data to make accurate estimates of the daily discharge.

Observer.—D. C. Warner, Quibell, Ontario.

Discharge Measurements of Wabigoon River near Quibell in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
June 4....	Binns, P. V......	124	1484	1.82	95.32	2703	....
July 18....	"	110	1258	1.20	93.34	1503	....
Aug. 1 (a)	"	84.4	720	1.72	26.59	1237	....
Sept. 17....	"	85.5	736	1.83	26.81	1347	....
Oct. 5....	"	83.8	703	1.62	26.36	1138	....
Nov. 11....	"	81.2	648	1.29	25.73	841	....

(a) New section established

Daily Gauge Height and Discharge of Wabigoon River near Quibell for 1914

Drainage Area 1,612 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.59	1,255	25.76	860	26.67	1,295	26.05	1,000	......	......
2	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.54	1,230	25.75	855	26.59	1,255	26.05	1,000	......	......
3	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.55	1,235	25.75	855	26.52	1,220	26.05	1,000	......	......
4	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.51	1,215	25.74	845	26.50	1,210	26.05	1,000	......	......
5	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.51	1,215	25.72	840	26.42	1,170	26.05	1,000	......	......
6	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.50	1,210	25.68	825	26.39	1,155	26.02	985	......	......
7	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.51	1,215	25.67	815	26.34	1,130	26.01	980	......	......
8	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.43	1,175	25.63	805	26.30	1,115	25.94	945	......	......
9	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.43	1,175	25.59	785	26.26	1,095	25.84	895	......	......
10	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.47	1,195	25.68	825	26.43	1,175	25.80	880	......	......
11	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.34	1,130	25.72	840	26.59	1,255	25.76	860	......	......
12	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.22	1,075	25.83	890	26.67	1,295	25.75	855	......	......
13	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.18	1,055	25.84	895	26.68	1,300	25.76	860	......	......
14	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.18	1,055	25.89	920	26.68	1,300	25.76	860	......	......
15	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.18	1,055	25.93	940	26.68	1,300	25.76	860	......	......
16	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.17	1,050	26.09	1,015	26.67	1,295	25.76	860	......	......
17	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.17	1,050	26.77	1,340	26.59	1,255	25.83	890	......	......
18	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.09	1,015	27.26	1,580	26.58	1,250	25.80	880	......	......
19	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.05	985	27.51	1,705	26.43	1,175	25.76	860	......	......
20	......	......	......	......	......	......	......	......	......	......	......	......	......	......	26.01	980	27.47	1,680	26.42	1,170	25.76	860	......	......
21	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.97	955	27.26	1,580	26.26	1,095	25.75	855	......	......
22	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.93	940	27.12	1,504	26.26	1,095	25.72	840	......	......
23	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.97	955	27.09	1,495	26.25	1,090	25.68	825	......	......
24	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.89	920	27.17	1,535	26.24	1,085	25.68	825	......	......
25	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.84	895	27.18	1,540	26.25	1,090	25.67	815	......	......
26	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.80	880	27.24	1,570	26.14	1,035	25.67	815	......	......
27	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.82	885	27.17	1,535	26.10	1,020	25.67	815	......	......
28	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.80	880	27.93	1,910	26.09	1,015	25.66	810	......	......
29	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.76	860	26.77	1,340	26.09	1,015	25.68	825	......	......
30	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.76	860	26.70	1,305	26.09	1,015	25.66	810	......	......
31	......	......	......	......	......	......	......	......	......	......	......	......	......	......	25.76	860	......	......	26.08	1,010	......	......	......	......

Monthly Discharge of Wabigoon River near Quibell for 1914

Drainage Area 1,612 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	1,255	860	1,050	0.78	0.53	0.651	0.75
September	1,910	785	1,181	1.19	0.49	0.732	0.81
October	1,300	1,010	1,160	0.81	0.63	0.719	0.83
November	1,000	810	885	0.62	0.50	0.549	0.61
December	....	....	....	....	....	....	....
The period	1,910	7 5	1,069	1.19	0.49	0.66	3.00

Wabigoon River—Wainwright Falls

English River—Upper Sturgeon Falls

Eagle River at Eagle River

Location—At the highway bridge, 1,000 feet south of the C. P. Ry. crossing of the river, and above the Cascades, in the Township of Aubrey, Kenora District. This river is a branch of the Wabigoon River.

Records Available—Monthly discharge measurements, Jan. to Nov., 1914. Daily gauge heights, Feb. 12 to Dec. 31, 1914.

Drainage Area—933 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and located on the south face of the bridge crib, near the south-east corner, next to the left bank of the river. The zero on the gauge (elevation 1,172.99) is referred to a bench mark (elevation 1,193.22) consisting of the head of a spike driven horizontally in the face of the water tank near the bridge, on the main line of the C. P. Ry. Another bench mark, at an elevation of 1,176.56 is painted on a rock, on the left bank, a few feet above the cross-section.

Channel—Straight for about 100 feet above the station, with the water running slowly. Below the section the channel is straight for about 20 feet, with swift water running to the fall over the Cascades. The banks are clean, high, rocky and not liable to overflow. The bed consists of solid rock and is practically permanent. At extreme high water the flow is cut up by the bridge piers, but under normal conditions the flow is all through one channel.

Discharge Measurements—Made from the highway bridge with a Price current meter.

Accuracy—This is nearly an ideal section. The sum of the differences between curve and measured discharges for same gauge heights is 3.09 per cent. of the sum of those measured discharges.

Observer—J. Nelson, Eagle River, Ontario.

Discharge Measurements of Eagle River at Eagle River in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
Jan. 8....	McLennan, C. C.	36	114	1.85	1173.55	212	....
Feb. 12....	"	35.5	109	1.81	1173.53	197	....
Mar. 20....	"	35	108	1.72	1173.53	187	....
" 26....	"	35	105	1.78	1173.49	189	....
" 26....	"	35	105	1.79	1173.49	189	....
" 27....	"	35	108	1.81	1173.51	197	....
Apr. 25....	"	35	115	1.79	1173.66	206	....
" 25....	"	35	115	1.76	1173.66	203	....
June 9....	Carmichael, R. M.	86	190	3.83	1175.24	730	....
" 9....	"	86	190	3.78	1175.24	721	....
" 9....	"	86	190	3.83	1175.24	731	....
" 9....	"	86	190	3.79	1175.24	724	....
" 10....	"	87.5	200	4.14	1175.41	831	....
" 10....	"	87.5	200	4.11	1175.41	824	....
July 30....	"	84	194	3.70	1175.16	718	....
" 31....	"	84	194	3.56	1175.11	689	....
Sept. 2....	McLennan, C. C. .	50	154	2.59	1174.41	398	....
" 2....	"	50	154	2.59	1174.41	399	....
" 3....	"	49.5	145	2.52	1174.28	365	....
" 3....	"	49.5	145	2.52	1174.28	366	....
" 18....	Binns, P. V......	52.5	158	3.08	1174.55	486	....
" 23....	"	51.8	157	2.92	1174.59	459	....
Oct. 7....	"	50.6	148	2.68	1174.47	399	....
" 7....	"	50.6	148	2.68	1174.46	397	....
Nov. 12....	"	46.1	143	2.61	1174.30	375	....

Daily Gauge Height and Discharge of Eagle River at Eagle River for 1914

Drainage Area 933 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	....	.....	....	....	1173.51	193	1173.50	191	1173.70	227	1174.65	477	1175.43	846	1175.16	689	1174.34	378	1174.49	423	1174.32	373	1174.26	355
2	....	.....	....	....	1173.53	196	1173.51	193	1173.68	224	1174.67	485	1175.43	883	1175.13	678	1174.30	367	1174.51	430	1174.36	388	1174.22	345
3	....	.....	....	....	1173.53	196	1173.52	194	1173.72	232	1174.72	502	1175.47	868	1175.16	689	1174.26	355	1174.49	423	1174.34	378	1174.22	345
4	....	.....	....	....	1173.53	196	1173.51	193	1173.81	250	1174.78	526	1175.41	831	1175.11	663	1174.20	340	1174.45	410	1174.36	388	1174.20	340
5	....	.....	....	....	1173.51	193	1173.51	193	1173.80	248	1174.80	533	1175.45	855	1175.09	654	1174.07	307	1174.41	398	1174.34	378	1174.20	340
6	....	.....	....	....	1173.51	193	1173.51	193	1173.84	256	1174.80	533	1175.49	883	1175.11	663	1174.20	340	1174.38	393	1174.32	373	1174.10	335
7	....	.....	....	....	1173.51	193	1173.51	193	1173.84	263	1174.80	533	1175.47	868	1175.09	654	1174.20	340	1174.38	393	1174.28	361	1174.18	335
8	....	.....	....	....	1173.53	193	1173.51	193	1173.93	275	1174.90	568	1175.45	855	1175.07	646	1174.18	335	1174.38	393	1174.32	373	1174.18	335
9	....	.....	....	....	1173.53	196	1173.51	193	1173.93	275	1175.24	730	1175.38	816	1174.99	609	1174.16	330	1174.36	388	1174.32	373	1174.16	330
10	....	.....	....	....	1173.53	196	1173.51	193	1173.97	284	1175.41	831	1175.30	765	1174.95	593	1174.18	335	1174.36	388	1174.32	373	1174.18	335
11	....	.....	....	....	1173.53	196	1173.51	193	1173.97	284	1175.49	883	1175.38	754	1174.95	584	1174.20	340	1174.38	393	1174.32	373	1174.18	335
12	....	.....	1173.53	196	1173.51	193	1173.49	188	1173.97	284	1175.49	883	1175.36	805	1174.95	584	1174.24	351	1174.38	393	1174.24	351	1174.16	330
13	....	.....	1173.55	198	1173.51	193	1173.48	186	1173.95	278	1175.59	948	1175.41	831	1174.95	584	1174.28	361	1174.41	398	1174.22	345	1174.16	330
14	....	.....	1173.53	196	1173.51	193	1173.49	188	1173.94	278	1175.51	960	1175.45	855	1174.99	609	1174.32	373	1174.49	423	1174.20	340	1174.16	330
15	....	.....	1173.53	196	1173.53	196	1173.48	186	1173.97	284	1175.55	920	1175.47	868	1174.91	576	1174.36	388	1174.53	438	1174.22	345	1174.16	330
16	....	.....	1173.53	196	1173.53	196	1173.49	188	1173.99	289	1175.56	891	1175.38	816	1174.82	542	1174.43	404	1174.53	438	1174.20	340	1174.16	330
17	....	.....	1173.57	203	1173.53	196	1173.51	193	1174.01	295	1175.56	993	1175.30	765	1174.82	542	1174.53	438	1174.53	438	1174.26	355	1174.16	330
18	....	.....	1173.57	203	1173.55	198	1173.53	196	1174.03	299	1175.53	908	1175.43	846	1174.80	533	1174.57	450	1174.55	444	1174.16	330	1174.16	330
19	....	.....	1173.57	203	1173.55	198	1173.58	204	1174.03	299	1175.61	960	1175.34	787	1174.78	526	1174.59	456	1174.53	438	1174.24	351	1174.16	330
20	....	.....	1173.57	203	1173.53	196	1173.62	210	1174.13	324	1175.53	920	1175.32	775	1174.74	509	1174.61	462	1174.43	430	1174.26	355	1174.16	330
21	....	.....	1173.53	196	1173.49	188	1193.63	216	1174.22	345	1175.53	908	1175.30	765	1174.72	502	1174.61	462	1174.49	423	1174.24	351	1174.16	330
22	....	.....	1173.53	196	1173.47	185	1173.65	217	1174.19	345	1175.53	908	1175.24	730	1174.68	488	1174.61	462	1174.49	423	1174.22	345	1174.16	330
23	....	.....	1173.55	193	1173.45	181	1173.65	217	1174.22	345	1175.56	993	1175.28	754	1174.66	480	1174.63	474	1174.49	423	1174.24	351	1174.16	330
24	....	.....	1173.51	193	1173.45	181	1173.65	217	1174.31	369	1175.53	908	1175.32	775	1174.61	462	1174.55	444	1174.49	423	1174.26	355	1174.14	326
25	....	.....	1173.55	198	1173.47	185	1173.66	219	1174.36	388	1175.56	908	1175.36	805	1174.57	450	1174.53	438	1174.47	417	1174.28	361	1174.14	326
26	....	.....	1173.51	193	1173.47	185	1173.66	219	1174.38	393	1175.53	908	1175.24	730	1174.53	438	1174.53	438	1174.32	373	1174.28	361	1174.11	318
27	....	.....	1173.51	193	1173.53	196	1173.66	219	1174.38	393	1175.45	855	1175.16	689	1174.49	423	1174.53	438	1174.36	388	1174.28	361	1174.14	326
28	....	.....	1173.49	188	1173.51	193	1173.68	224	1174.48	420	1175.45	855	1175.24	730	1174.47	417	1174.51	430	1174.34	378	1174.26	355	1174.14	326
29	....	.....	....	....	1173.51	193	1173.68	224	1174.47	417	1175.45	855	1175.16	689	1174.45	410	1174.49	423	1174.32	373	1174.28	361	1174.14	326
30	....	.....	....	....	1173.51	193	1173.70	227	1174.53	438	1175.45	855	1175.13	678	1174.41	398	1174.49	423	1174.32	373	1174.28	361	1174.14	326
31	....	.....	....	....	1173.51	193	....	....	1174.65	477	....	....	1175.16	689	1174.39	393	....	.....	1174.34	378	....	....	1174.11	318

Monthly Discharge of Eagle River at Eagle River for 1914

Drainage Area, 933 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	198	181	193	0.21	0.19	0.21	0.24
April	227	186	202	0.24	0.20	0.22	0.24
May	477	224	315	0.51	0.24	0.33	0.39
June	993	477	798	1.06	0.51	0.85	0.95
July	883	678	794	0.95	0.73	0.85	0.98
August	689	393	548	0.74	0.42	0.59	0.68
September	474	307	396	0.51	0.33	0.42	0.47
October	444	373	408	0.48	0.40	0.44	0.50
November	388	330	360	0.42	0.35	0.39	0.44
December	355	318	322	0.38	0.34	0.34	0.39
The period	993	181	434	1.06	0.19	0.49	5.28

English River at Ear Falls

Location.—At the foot of Lac Suel, about 3 miles below Pine Ridge Hudson's Bay Co., post, and about ¼ mile above Upper Ear Falls, Kenora District.

Records Available.—Monthly discharge measurements, July to Oct., 1914. Daily gauge heights, read at the main H. B. Co. post, 75 miles above the section on Lac Suel, but do not give the fluctuations at the gauging section.

Drainage Area.—Not measured.

Gauge.—Vertical steel staff with enamelled face, graduated in feet and inches, and screwed to a 6-inch hewn spruce post, which is firmly wedged in a rock on the left bank, 200 feet below a 2 inch poplar, which is painted with white paint and used as the initial point for surroundings. The zero on the gauge (elevation 115.14) is referred to a bench mark (elevation 122.78) painted on a rock 5 feet above the gauge. Another bench mark (elevation 122.08) is located at the head of the falls, 30 feet west of the portage entrance, directly below the section.

Channel.—Straight for about 400 feet above and 300 feet below the station, to the Upper Ear Falls. Both banks are high, rocky and wooded and will not overflow. The bed of the stream is composed of rock with a little gravel, apparently stable. The current is sluggish, flowing through one channel at all stages.

Discharge Measurements.—Made from a canoe with a Price small current meter.

Accuracy.—Backwater on the left bank at certain stages of the river, causes difficulty in making accurate measurements of the discharge.

Discharge Measurements of English River at Ear Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
July 4....	Binns, P. V.	339	8786	1.01	120.02	8906	....
Aug. 10....	"	338.6	8749	1.06	119.85	9318	....
Sept. 12....	McLennan, C. C.	337	8643	.85	119.52	7408	....
Oct. 30....	Binns, P. V.	345.1	8562	.79	119.28	6801	....

English River at Manitou Falls

Location.—About 800 feet above the first chute of the Manitou Falls, and 5 miles below the old Mattawa H. B. Co. post, Kenora District. Cedar River enters the English River ½ mile below the metering station, after which the English River flows west.

Records Available.—Monthly discharge measurements, July to Oct., 1914.

Drainage Area.— Not measured.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and screwed to a 6 inch hewn pine post firmly wedged and wired to the right bank, 15 feet south of the initial point, which consists of a 2 inch blazed jack pine, about 800 feet above the first fall. The zero of the gauge (elevation 89.42) is referred to a bench mark (elevation 100.43) painted on a rock 2.5 feet south-east of the initial point. It is also referred to a bench mark (assumed elevation 100.00) located on the left bank, 800 feet south of the section and at the head of the falls, 50 feet west of the head of the portage.

Channel—At a point 1,200 feet above the station, the river turns to the right into a comparatively straight stretch, and opens into a weedy marsh or small lake 800 feet below the section, just above the falls. Both banks are high, rocky and wooded and will not overflow. The current is sluggish and flows through one channel at all stages.

Discharge Measurements—Made from a canoe with a small Price current meter.

Discharge Measurements of English River at Manitou Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
July 3....	McLennan, C .	190.7	3881	2.46	93.46	9555	....
Aug. 9....	" .	195.7	3961	2.59	93.84	10279	....
Sept. 30....	" .	185.9	3721	2.30	92.68	8580	....
Oct. 31....	" .	183	3619	2.28	92.09	8257	....

English River near Oak Lake Falls

Location—About 1 mile above the upper fall of Oak Lake Falls, and about ½ mile below Wilcox Lake, District of Kenora.

Records Available—Monthly discharge measurements, Aug. to Nov., 1914.

Drainage Area—Not measured.

Gauge—A bench mark gauge located on a rock in the river at the station near the right bank. The initial point for soundings is established on the left bank, and consists of the head of a nail driven into the blazed side of a 12 inch poplar, painted I. P. N. 70° W.

Channel—Straight for about 300 feet above and ½ mile below the station. Both banks are high, rocky, wooded and not liable to overflow. The bed of the stream is rocky and practically permanent. The current is sluggish at the station, but swift through the little rapids 800 feet below after which it becomes sluggish to the head of the falls. One channel exists at all stages.

Discharge Measurements—Made from a canoe with a small Price current meter.

Discharge Measurements of English River near Oak Lake Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
Aug. 7....	McLennan., C. C.	397.2	7011	1.68	197.11	11344	....
Sept. 27....	" .	390.9	6774	1.41	196.50	9568	....
Nov. 5....	" .	387.7	6672	1.30	196.25	8698	....
Dec. 23....	" .	383.0	6429	1.11	195.64	7131	....

English River at Sturgeon Falls

Location.—Located about 300 feet above the lowest of the three falls known as Sturgeon Falls, District of Kenora.

Records Available.—Monthly discharge measurements, from June to Oct., 1914.

Drainage Area.—Not measured.

Gauge.—Vertical steel staff with enamelled face, graduated in feet and inches, and screwed to a 5 inch hewn spruce post, firmly wedged and braced to the left bank, about 150 feet below the station. The zero on the gauge (elevation 91.52) is referred to a bench mark (assumed elevation 100.00) on the left bank, 10 feet from the initial point and 2 feet below the line of the section. The initial point for soundings is blazed on the edge of a 6 inch poplar on the left bank and marked I. P. N. 10° E.

Channel.—There are deep bays on both sides of the river above the station, from which point the water flows in a comparatively straight channel gradually narrowing towards the head of the falls. Both banks are high, rocky and wooded and will not overflow. The bed is composed of rock with a little sand in the centre of the river. The velocity is low at the left bank, slight backwater existing at higher stages.

Discharge Measurements.—Made from a canoe with a small Price current meter.

Control.—The Dryden Timber and Power Co. operate a dam on the Wabigoon River, which is a tributary stream.

Discharge Measurements of English River at Sturgeon Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
June 12....	McLennan, C. C.	362	8829	1.36	93.85	11996	....
July 14....	" .	388	9397	1.53	95.36	14403	....
Sept. 11....	" .	354	8620	1.29	93.25	11089	....
Oct. 22....	" .	357	8724	1.31	93.55	11444	....

English River—Lower Sturgeon Falls

English River—Caribou Falls

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English River at Caribou Falls

Location—About 1,200 feet above Caribou Falls, the lowest falls on the river, District of Kenora.

Records Available—Monthly discharge measurements, May to Oct., 1914.

Drainage Area—Not measured.

Gauge—Vertical staff located on the left bank of the river, 25.6 feet north of a blazed jack pine, which is used as the initial point for soundings. The zero on the gauge (elevation 100.00) is referred to a bench mark (elevation 109.45) painted on the point of a rock, 16 feet south of the blazed jack pine.

Channel—Above the station the channel takes a sharp 90 degree curve to the right, thence flowing comparatively straight to the head of the falls. Both banks are high, rocky and wooded and not liable to overflow. The bed of the stream is rocky, with large boulders or protruding shelves of rock and practically permanent. The water near the left bank is still.

Discharge Measurements—Made from a canoe and raft with a small Price current meter.

Control—The Dryden Timber and Power Co. operate a plant on the Wabigoon River, a tributary stream.

Discharge Measurements of English River at Caribou Falls in 1914

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1914							
May 25....	McLennan, C. C.	236	10051	.87	101.72	8785	....
June 14....	"	239	10214	1.43	102.92	14606	....
July 11....	"	240	10342	1.53	103.17	15812	....
Sept. 5....	"	239	10165	1.18	102.36	12061	....
" 6....	"	239	10169	1.19	102.39	12162	....
" 6....	"	239	10165	1.19	102.36	12188	....
" 7....	"	239	10180	1.17	102.36	11935	....
" 7....	"	239	10166	1.09	102.35	11182	....
" 8....	"	239	10164	1.16	102.33	11774	....
Oct. 20....	"	240	10191	1.22	102.45	12409	....
Dec. 14....	"	236	10020	.88	101.75	8885	....

Miscellaneous Measurements

River	Date	Discharge in Sec-ft.	Location
Abitibi	Oct. 23, 1911	5,487	At Iroquois Falls
"	Feb. 2, 1912	3,026	At Couchiching Falls
"	Mar. 12, 1913	1,743	Above Iroquois Falls
"	Mar. 13, 1913	2,493	¾ mile above Black River
"	April 8, 1914	947	Iroquois Falls
Black (Nipissing)	Mar. 26, 1913	248	Above McDougall's Chutes
Bonnechere	Oct. 4, 1913	117	Round Lake Dam
"	Oct. 6, 1913	106	Golden Lake
Boyne	June 11, 1912	66	Alliston
"	July 6, 1912	12	"
"	Aug. 9, 1912	66	"
"	Sep. 13, 1912	27	"
"	Oct. 13, 1912	50	"
Driftwood	Mar. 22, 1911	39	Monteith
English	May 26, 1906	6,740	Pelican Falls
"	June 2, 1906	6,702	Manitou Rapids
"	Feb. 6, 1914	1624	Pelican Falls
"	Mar. 4, 1914	1337	" "
Gull	July 27, 1911	532	Minden
"	Sept. 6, 1911	546	"
"	Oct. 9, 1911	642	"
"	Nov. 3, 1911	448	"
"	Dec. 9, 1911	696	"
"	Jan. 10, 1912	569	"
"	Feb. 9, 1912	410	"
"	Mar. 8, 1912	405	"
"	Apr. 15, 1912	1,124	"
"	May 15, 1912	1,613	"
"	June 13, 1912	780	"
"	July 15, 1912	1,561	"
Kaministiquia	Aug. 12, 1905	2,737	Fort William
"	Sep. 6, 1905	2,091	Tonkin's Farm
"	Sep. 8, 1905	882	Silver Falls
"	Feb. 3, 1906	1,100	Kakabeka Falls
"	Jan. 28, 1906	662	Silver Falls
"	Mar. 10, 1906	880	Kakabeka Falls
"	Mar. 6, 1906	494	Silver Falls
"	Oct. 6, 1906	1,355	Tonkin's Farm
Kawa Kash Kagama	Sep. 20, 1906	159	Howard's Falls
Kapuskasing	Sep. 20, 1911	679	Loon Falls
"	Sep. 21, 1911	713	Lapenagam Falls
"	Sep. 23, 1911	1,074	Wendega Falls
"	Sep. 24, 1911	967	Kabohose Falls
"	Oct. 26, 1911	933	Weiswinin Falls
"	Feb. 28, 1912	613	Sesebegagan Falls
"	Feb. 29, 1912	686	Weiswinin Falls
Maganetawan	Oct. 10, 1912	391	Byng Inlet
"	Nov. 11, 1912	1,053	" "
"	Dec. 12, 1912	2,044	" "
"	Jan. 13, 1913	965	" "
"	Feb. 10, 1913	965	" "
"	Mar. 14, 1913	827	" "
"	July 8, 1913	1,311	" "
"	Aug. 12, 1913	535	" "
"	Sep. 10, 1913	Nil	" "
Mettagami	Mar. 25, 1912	633	Sandy Bay Falls
"	Mar. 27, 1912	415	Wawiatan Falls
"	Mar. 16, 1913	195	" "
"	Mar. 29, 1913	240	" "
"	Mar. 30, 1913	232	" "
"	Mar. 30, 1913	207	" "
"	Mar. 30, 1913	218	" "
"	July 15, 1911	792	" "

Miscellaneous Measurements—Continued

River	Date	Discharge in Sec-ft.	Location
Mettagami	July 11, 1911	921	Kenogamisse Falls
"	Feb. 7, 1912	1,421	Smooth Rock Falls
"	Jan. 24, 1912	1,608	Sturgeon Falls
Madawaska	Oct. 3, 1913	692	Below Calabogie
Mississippi	Oct. 2, 1913	196	Snow Road
Missanaibi	Aug. 21, 1911	561	St. Paul's Falls
"	Aug. 24, 1911	1,107	Pond Falls
"	Aug. 26, 1911	1,756	Sandy Bay, Glass Falls
"	Mar. 3, 1912	736	Glass Falls
Montreal	Jan. 8, 1908	930	Gillies Siding
Moira	Oct. 25, 1905	700	Belleville
"	Nov. 8, 1905	590	"
"	Dec. 5, 1905	946	"
Nepigon	Sep. 15, 1905	8,924	Pine Portage
"	Nov. 3, 1905	7,014	Cameron's Pool
"	Feb. 9, 1906	5,982	"
"	Mar. 23, 1906	5,879	"
"	Sep. 30, 1906	5,884	"
North-West	Sep. 13, 1912	256	Foot Print Lake
Onaping	Jan. 1906	254	High Falls
Pic	Aug. 5, 1906	154	Lake Superior Portage
Rainy	Oct. 25, 1905	14,145	Fort Frances
"	Apr. 1, 1906	6,805	"
"	Sep. 26, 1910	5,229	"
Rouge Creek	May 14, 1912	24	Markham
"	May 14, 1912	23	"
"	June 21, 1912	23	"
"	July 16, 1912	7	"
"	Aug. 17, 1912	11	"
"	Sep. 14, 1912	43	"
"	Oct. 14, 1912	69	"
Saugeen	July 17, 1911	164	Chesley
"	Aug. 16, 1911	140	"
"	Sep. 13, 1911	168	"
"	Oct. 13, 1911	174	"
"	Nov. 7, 1911	185	"
"	Dec. 19, 1911	181	"
"	Jan. 24, 1912	180	"
"	Feb. 21, 1912	179	"
"	Mar. 26, 1912	233	"
"	Apr. 11, 1912	2,151	"
"	Apr. 24, 1912	369	"
"	May 28, 1912	236	"
"	June 25, 1912	182	"
"	June 25, 1912	100	"
"	July 24, 1912	168	"
"	July 24, 1912	102	"
"	Aug. 23, 1912	96	"
"	Aug. 24, 1912	169	"
"	Sep. 25, 1912	118	"
"	Sep. 25, 1912	78	"
"	Oct. 28, 1912	121	"
Severn	Aug. 22, 1906	1,206	Big Chute
"	Nov. 9, 1905	1,503	"
Sturgeon (Nipissing)	Jan. 19, 1906	1,230	Smoky Falls
Sturgeon (Thunder Bay)	July 26, 1906	251	Beaver Falls
Seine	July 9, 1906	1,842	Island Falls
Trent	Oct. 16, 1905	2,200	Trenton
"	Oct. 25, 1905	2,406	"
"	Nov. 7, 1905	2,196	"
"	Nov. 16, 1905	2,090	Healey Falls
Vermillion	Jan. 1906	791	Wabageshik Chute
Wabigoon	Oct. 9, 1905	206	Dryden
"	Apr. 24, 1914	230	Wainwright Falls

Miscellaneous Measurements—Concluded

River	Date	Discharge in Sec-ft.	Location
White Fish	Jan. 1906	207	White Fish Falls
"		146	Below Penache Lake
Winnipeg	Oct. 14, 1905	5,321	Eastern Outlet
"	Apr. 8, 1906	4,490	" "
"	Oct. 16, 1905	899	L. of W. Milling Co. head-race
"	Oct. 16, 1905	400	Keewatin Lumber Co.
"	Oct. 18, 1905	21,794	Western Outlet
"	Dec. 17, 1914	8,537	Minaki
"	Oct. 17, 1914	546	Whitedog (north channel)
"	Dec. 15, 1914	354	Whitedog (north channel)
"	Oct. 18, 1914	12,224	Whitedog (south channel)
"	Jan. 20, 1914	7,661	Whitedog Falls
"	Dec. 16, 1914	8,788	Whitedog Falls
York	Oct. 7, 1913	136	Below High Falls
"	Oct. 8, 1913	181	Below Bancroft

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations for which such data are available in this report.

Station	Drainage Area	1914												
		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Beaver River at Eugenia Falls	74	0.47	0.74	0.99	2.38	1.17	0.68	0.48	0.42	0.34	0.42	0.56	0.56	0.77
Beaver River at Feversham	37.1	......	......	0.90	0.93	0.96	0.58	0.39	0.39	0.34	0.32	0.44	0.61	......
Eagle River at Eagle River	933	......	......	0.21	0.22	0.33	0.85	0.85	0.59	0.42	0.44	0.39	0.34	......
Footprint River at Rainy Lake Falls	588	......	......	......	......	......	......	......	......	0.405	0.173	......	......	......
Maitland River at Ben Miller	950	1.36	1.48	3.86	2.35	0.46	0.21	0.13	0.12	0.14	0.13	0.59	0.98	0.98
Manitou River at Devil's Cascades	440	......	......	......	......	......	......	......	0.588	0.482	0.511	0.503	......	......
Muskoka River at Tretheway's Falls	658	......	......	......	......	......	1.73	1.63	0.49	0.47	0.44	0.66	0.94	......
Nottawasaga River near Nicolston	325	......	......	......	......	......	......	......	......	0.397	0.542	0.745	0.649	......
Saugeen River near Port Elgin	1,565	......	......	......	......	0.84	0.44	0.33	0.30	0.26	0.32	0.74	0.65	......
Saugeen River near Walkerton	895	......	......	......	......	0.70	0.34	0.29	0.31	0.24	0.32	0.66	0.73	......
Seine River at Skunk Rapids	3,483	......	......	......	......	......	......	......	......	......	0.411	0.350	......	......
Severn River at Severn Bridge	2,075	0.46	0.46	0.45	1.48	1.34	0.52	0.47	......	......	......	......	.58	......
South River near Powassan	322	......	......	......	4.66	2.45	0.70	0.40	0.40	0.53	0.49	0.82	0.79	......
Sturgeon River near Smoky Falls	2,135	......	......	......	1.69	3.95	1.55	1.325	0.891	0.847	0.973	1.305	1.077	......
Thames River near Byron, main stream	1,270	......	......	......	......	1.36	0.563	0.38	0.34	0.481	0.33	0.73	1.06	......
Wabigoon River near Quibell	1,612	......	......	......	......	......	......	......	0.651	0.732	0.719	0.549	......	......

Grand River Watershed Regular Stations

River	Location	Drainage Area Sq. Miles	Township	County
Boston Creek.......	near York...........	123	Oneida	Haldimand .....
Conestogo	at St. Jacob's.........	312	Woolwich	Waterloo ....
Fairchild's Creek...	near Onondaga	112	Onondaga	Brant..........
Galt Creek	at Galt...............	48	Dumfries N.......	Waterloo ....
Grand.............	at Belwood	270	Garafaxa	Wellington .....
"	at Brantford	1,991	Brantford........	Brant..........
"	near Conestogo	538	Woolwich.........	Waterloo ....
"	at Galt...............	1,356	Dumfries N.......	Waterloo ....
"	at Glen Morris........	1,385	Dumfries S.......	Brant..........
"	at York	2,311	Oneida	Haldimand .....
Irvine.............	near Salem...........	64	Nicol.............	Wellington .....
Nith	near Canning.........	386	Blenheim.........	Oxford ....
Speed	at Hespeler...........	259	Waterloo	Waterloo ....
"	at Caraher's Bridge...	80.5	Guelph	Wellington .....
Whiteman's Creek ..	near Burford	153	Brantford	Brant..........

Grand River at Belwood

Location—At the bridge in the Village of Belwood, on the 7th concession, Township of Garafraxa, County of Wellington.

Records Available—Aug. 1st, 1913, to Dec. 31st, 1914.

Drainage Area—270 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on right abutment. Elev. of zero on gauge, 1366.00, which has remained unchanged since established.

Channel—The channel bed at the bridge is solid rock, and is permanent at all stages. The channel at the low-water section is shifting during high-water conditions.

Discharge Measurements—Made from the bridge, except at low-water period, when a permanent cross-section is used, located 400 feet down stream.

Winter Flow—Winter readings are taken here to determine the winter discharge. During the months December to March the relation between gauge height and discharge is greatly affected, as much as two feet of ice forming at the gauge.

Accuracy—The river stage at this section is not affected by any power plants above or below. The records can be classed as good.

Observer—Lloyd Mosure.

Discharge Measurements of Grand River at Belwood in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 30....	Roberts, E	14	5	.56	1366.79	3	....
Aug. 26....	"	14	6	.76	1366.83	5	....
Sept. 20....	"	14	7	.77	1366.87	5	....
Oct. 28....	"	55	19	.65	1367.08	12	....
Nov. 25....	"	70	59	2.56	1367.62	152	....
Dec. 18....	"	70	37	1.27	1367.29	47	....
1914							
Mar. 3....	"	90	31	.50	1368.08	15	....
Feb. 3 (a)	"	90	138	2.26	1369.00	312	....
April 7....	"	110	195	1.98	1368.20	385	....
" 20....	"	110	517	1.15	1368.42	595	....
" 26....	"	110	438	.58	1367.96	255	....
June 11....	"	60	18	.54	1367.00	10	....
July 8....	"	59	11	.28	1366.83	3	....
Aug. 4....	"	57	10	.26	1366.83	2	....
Sept. 1....	"	60	15	.48	1366.96	7	....
" 1....	"	59	14	.48	1366.96	7	....
" 1....	"	59	15	.48	1366.96	7	....
" 16....	"	59	11	.35	1366.92	3	....
" 16....	"	59	10	.38	1366.92	4	....
Oct. 6....	"	59	12	.35	1366.89	4	....
" 6....	"	59	12	.36	1366.89	4	....
" 6....	"	59	12	.36	1366.89	4	....
Nov. 25 (a)	"	69	47	1.02	1367.42	48	....
Dec. 29 (a)	"	77	28	1.09	1367.50	31	....

(a) Ice conditions

Daily Gauge Height and Discharge of Grand River at Belwood for 1913

Drainage Area, 270 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.79	4	1366.83	5	1366.83	5	1367.00	8	1367.37	65
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.77	3	1366.83	5	1366.83	5	1367.00	8	1367.37	65
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.75	3	1366.83	5	1366.83	5	1367.00	8	1367.37	65
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.75	3	1366.83	5	1366.83	5	1367.00	8	1367.33	56
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.75	3	1366.83	5	1366.83	5	1367.00	8	1367.33	56
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.77	3	1366.83	5	1366.83	5	1367.00	8	1367.33	56
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.79	4	1366.79	4	1366.83	5	1367.00	8	1367.46	87
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.79	4	1366.79	4	1366.83	5	1367.04	10	1367.33	56
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.89	7	1366.79	4	1366.83	5	1367.06	12	1367.33	56
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.96	9	1366.79	4	1366.83	5	1367.23	36	1367.33	56
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.90	7	1366.79	4	1366.85	5	1367.17	26	1367.33	56
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.88	6	1366.81	4	1366.92	7	1367.04	10	1367.33	56
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.85	5	1366.79	4	1366.92	7	1367.17	26	1367.33	56
14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.83	5	1366.79	4	1366.92	7	1367.17	26	1367.20	31
15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.81	4	1366.79	4	1366.88	6	1367.17	26	1367.20	31
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.79	4	1366.79	4	1366.88	6	1367.17	26	1367.20	31
17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.79	4	1366.85	5	1366.88	6	1367.08	14	1367.27	43
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.77	3	1366.90	7	1366.92	7	1367.04	10	1367.25	40
19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.75	3	1366.88	6	1367.00	11	1367.42	77	1367.25	40
20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.75	3	1366.87	5	1367.00	11	1367.71	156	1367.25	40
21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.92	7	1366.90	7	1367.00	11	1367.69	150	1367.12	18
22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.96	9	1366.85	5	1367.00	11	1367.62	130	1367.12	18
23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.94	9	1366.83	5	1367.10	18	1367.71	156	1367.12	18
24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.88	6	1366.85	5	1367.19	31	1367.71	156	1367.08	14
25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.83	5	1366.88	6	1367.13	21	1367.60	124	1367.08	14
26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.83	5	1366.88	6	1367.04	13	1367.54	108	1367.08	14
27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.83	5	1366.85	5	1367.04	13	1367.48	92	1367.08	14
28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.83	5	1366.83	5	1367.05	13	1367.42	77	1367.08	14
29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.85	5	1366.85	5	1367.08	16	1367.35	61	1367.08	14
30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.88	6	1366.88	6	1367.06	14	1367.33	56	1367.08	14
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1366.88	6	.....	.....	1367.00	11	.....	.....	1367.08	14

Daily Gauge Height and Discharge of Grand River at Belwood for 1914

Drainage Area, 270 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1367.08	14	1369.08	113	1368.16	10	1370.54	2080	1368.08	324	1367.04	10
2	1367.08	14	1369.08	430	1368.08	16	1370.75	2240	1368.25	432	1367.04	10
3	1367.08	14	1369.04	320	1368.08	16	1369.75	1520	1367.83	196	1367.04	10
4	1367.08	14	1368.83	232	1368.08	9	1369.04	1020	1367.66	144	1367.04	10
5	1367.08	14	1368.71	172	1368.08	6	1368.58	682	1367.58	118	1367.04	10
6	1367.08	14	1368.68	58	1368.08	6	1368.16	373	1367.58	118	1367.00	8
7	1367.08	14	1368.66	18	1368.08	5	1368.16	373	1367.58	118	1367.02	9
8	1367.08	14	1368.62	4	1368.08	5	1368.50	97	1368.00	274	1367.20	31
9	1367.08	14	1368.33	4	1367.58	5	1367.42	77	1367.66	144	1367.08	14
10	1367.08	14	1368.33	4	1367.62	5	1367.96	250	1367.66	144	1367.04	10
11	1367.16	24	1368.33	4	1367.66	5	1367.92	232	1367.58	118	1367.00	8
12	1367.25	40	1368.33	4	1367.54	5	1367.75	169	1367.50	97	1367.00	8
13	1367.20	32	1368.29	4	1367.54	24	1367.75	169	1367.42	77	1366.92	5
14	1367.16	24	1368.25	4	1367.58	70	1367.83	196	1367.42	77	1366.92	5
15	1367.16	24	1368.25	4	1368.33	185	1367.96	250	1367.42	77	1366.92	5
16	1367.25	40	1368.25	5	1369.71	570	1368.00	274	1367.42	77	1366.92	5
17	1367.25	40	1368.25	6	1370.42	1200	1368.00	274	1367.25	40	1366.87	4
18	1367.25	40	1368.25	7	1370.46	805	1368.00	274	1367.25	40	1366.92	5
19	1367.25	40	1368.25	8	1370.50	645	1368.08	324	1367.20	31	1366.94	6
20	1367.25	40	1368.00	11	1370.54	455	1368.33	490	1367.14	21	1366.92	5
21	1367.25	40	1368.00	9	1370.56	445	1368.25	420	1367.12	18	1366.92	5
22	1367.25	40	1367.75	6	1370.10	374	1368.20	398	1367.08	14	1366.92	5
23	1367.25	40	1367.75	4	1369.73	256	1368.04	300	1367.08	14	1366.92	5
24	1367.42	43	1368.00	4	1369.50	238	1367.62	130	1367.50	97	1367.00	8
25	1367.42	49	1368.00	4	1369.56	280	1367.79	182	1367.50	97	1366.96	6
26	1367.42	56	1368.08	4	1370.66	800	1367.92	232	1367.12	18	1366.92	5
27	1367.58	65	1368.16	5	1370.89	2350	1367.92	232	1367.08	14	1366.92	5
28	1367.62	75	1368.16	6	1370.77	2160	1367.83	196	1367.10	16	1366.92	5
29	1367.71	80	....	....	1370.58	2120	1367.87	211	1367.08	14	1366.94	6
30	1367.79	87	....	....	1371.25	2630	1368.33	490	1367.08	14	1366.96	6
31	1368.79	100	....	....	1370.96	2400	....	....	1367.04	10	....	....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1366.92	5	1366.75	3	1367.10	16	1366.85	4	1367.08	14	1368.50	625
2	1366.92	5	1366.75	3	1367.04	10	1366.83	4	1367.08	14	1368.46	590
3	1366.93	5	1366.79	4	1367.12	18	1366.83	4	1367.12	18	1368.35	510
4	1366.92	5	1366.83	4	1367.06	12	1366.83	4	1367.12	18	1367.98	262
5	1366.92	5	1366.79	4	1367.04	10	1366.83	4	1367.12	18	1367.52	102
6	1366.92	5	1366.79	4	1367.06	12	1366.83	4	1367.00	8	1367.83	196
7	1366.92	5	1366.77	4	1367.00	8	1366.83	4	1367.08	14	1367.50	97
8	1366.87	4	1366.79	4	1367.00	8	1366.83	4	1367.08	14	1367.70	185
9	1366.83	4	1366.75	3	1367.00	8	1367.00	8	1367.00	8	1367.85	203
10	1366.87	4	1366.83	4	1366.96	6	1367.10	16	1367.04	10	1367.75	189
11	1366.79	4	1366.83	4	1366.96	6	1367.20	31	1367.04	10	1367.56	113
12	1366.79	4	1366.83	4	1366.94	6	1367.16	24	1367.08	14	1367.37	65
13	1366.81	4	1366.85	4	1366.92	5	1367.08	14	1367.18	14	1367.25	40
14	1366.83	4	1366.96	6	1366.92	5	1367.14	21	1367.25	40	1367.25	40
15	1366.83	4	1366.87	4	1366.92	5	1367.06	12	1367.35	60	1367.29	47
16	1366.83	4	1366.85	4	1366.87	4	1367.06	12	1367.85	201	1367.29	47
17	1366.83	4	1366.92	5	1366.92	5	1367.04	10	1367.75	169	1367.20	31
18	1366.83	4	1366.96	6	1366.87	4	1367.04	10	1367.46	87	1367.31	29
19	1366.79	4	1366.98	7	1366.83	4	1367.04	10	1367.50	97	1367.35	30
20	1366.79	4	1367.12	18	1366.83	4	1367.08	14	1367.42	77	1367.96	33
21	1366.77	4	1367.08	14	1366.83	4	1367.04	10	1367.33	56	1367.42	31
22	1366.75	3	1367.08	14	1366.83	4	1367.04	10	1367.42	77	1367.46	31
23	1366.75	3	1367.04	10	1366.96	6	1367.00	8	1367.42	77	1367.42	31
24	1366.79	4	1367.00	8	1366.96	6	1367.00	8	1367.42	77	1367.42	31
25	1366.79	4	1366.92	5	1366.92	5	1367.00	8	1367.42	77	1367.42	31
26	1366.75	3	1366.90	5	1366.92	5	1367.00	8	1367.44	82	1367.33	27
27	1366.75	3	1366.87	4	1366.87	4	1367.00	8	1367.96	250	1367.35	27
28	1366.75	3	1366.87	4	1366.87	4	1367.00	8	1368.29	377	1367.39	31
29	1366.81	4	1366.96	6	1366.87	4	1367.00	8	1367.92	232	1367.42	31
30	1366.79	4	1367.00	8	1366.87	4	1367.02	9	1367.92	232	1367.42	31
31	1366.75	3	1366.92	5	....	....	1367.06	12	....	....	1367.42	31

Monthly Discharge of Grand River at Belwood for 1913

Drainage Area. 270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	9	3	5	.03	.01	.02	.02
September	7	4	5	.03	.01	.02	.02
October	31	5	9	.11	.02	.03	.03
November	156	8	54	.58	.03	.20	.22
December	87	14	39	.32	.05	.14	.16
The period	156	3	22	.58	.01	.08	.45

Monthly Discharge of Grand River at Belwood for 1914

Drainage Area, 270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	100	14	37	.37	.05	.14	.16
February	430	4	52	1.59	.01	.19	.20
March	2,630	5	584	9.74	.02	2.16	2.49
April	2,240	77	472	8.30	.28	1.75	1.95
May	432	10	96	1.60	.04	.36	.40
June	31	4	7	.11	.01	.03	.03
July	5	3	4	.02	.01	.01	.01
August	18	3	5	.07	.01	.02	.02
September	18	4	6	.07	.01	.02	.02
October	31	4	10	.11	.01	.04	.04
November	377	8	81	1.40	.03	.30	.33
December	625	27	122	2.31	.10	.45	.52
The year	2,630	3	124	9.74	.01	.46	6.17

Grand River at Conestogo

Location—At the bridge ¼ mile below the Village of Conestogo.

Records Available—July 16th, 1913, to Dec. 31st, 1914.

Drainage Area—538 sq. miles.

Gauge—Vertical staff, 0 ft.—12 ft. on 2nd pier from right bank. Elev. of zero is 1017.00.

Channel—Gravel forms the bed of the stream. The banks are permanent.

Discharge Measurement—Made from the bridge, and a permanent low-water cross-section is located 600 feet upstream.

Control—The river stage at this section is free from any serious fluctuations, and the flow is natural.

Winter Flow—Ice affects the relation between gauge height and discharge. Winter readings are taken to determine this flow. The period affected is from about the middle of December to the middle of March.

Accuracy—Apart from the fact that the river bed is shifting during high water period, the conditions at this station are favorable.

Observer—E. Schinbein.

Discharge Measurements of Grand River at Conestogo in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 16....	Roberts, E	135	66	.75	1018.10	48	....
Aug. 27....	"	125	40	.52	1017.64	21	....
Sept. 23....	"	125	46	.65	1017.69	30	....
Oct. 29....	"	135	69	.78	1018.17	54	....
Nov. 27....	"	140	147	1.93	1018.62	283	....
Dec. 19....	"	140	75	.83	1018.14	62	....
1914							
Feb. 4 (a)	"	127	240	1.62	1020.00	389	....
Mar. 4 (a)	"	96	164	.40	1019.33	66	....
" 28....	"	....	....	....	1022.56	....	....
April 8....	"	120	232	2.69	1019.41	626	....
" 22....	"	120	247	2.64	1019.50	654	....
June 12....	"	100	119	.33	1017.83	38	....
July 10....	"	123	39	.31	1017.62	12	....
Aug. 5....	"	123	39	.35	1017.58	13	....
Sept. 1....	"	130	73	.94	1018.12	68	....
" 1....	"	130	74	.90	1018.12	67	....
" 1....	"	130	73	.93	1018.12	67	....
" 16....	"	128	52	.59	1017.83	30	....
" 16....	"	128	52	.60	1017.83	31	....
Oct. 6....	"	128	53	.58	1017.83	30	....
Nov. 26....	"	149	156	.81	1018.42	126	....
Dec. 30 (a)	"	139	87	.86	1018.75	74	....

(a) Ice conditions

Daily Gauge Height and Discharge of Grand River at Conestogo for 1913

Drainage Area 538 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft
1															1017.77	22	1017.97	43	1017.75	21	1018.04	78	1018.40	197
2															1017.77	22	1017.77	22	1017.81	26	1017.88	46	1018.37	185
3															1017.56	10	1017.66	16	1017.67	16	1017.94	57	1018.35	177
4															1017.55	10	1017.68	17	1017.69	17	1018.00	90	1018.36	182
5															1017.62	13	1017.80	25	1017.66	16	1017.96	61	1018.29	155
6															1017.66	16	1017.83	28	1017.70	18	1017.90	50	1018.35	177
7															1017.75	21	1017.60	12	1017.68	17	1017.90	50	1018.56	258
8															1017.75	21	1017.75	21	1017.75	21	1018.04	78	1018.33	170
9															1017.89	34	1017.66	16	1017.72	20	1017.96	61	1018.46	220
10															1018.06	61	1017.66	16	1017.75	21	1018.33	170	1018.31	163
11															1018.12	78	1017.64	14	1017.85	30	1018.33	170	1018.29	157
12															1018.10	72	1017.78	23	1017.72	19	1018.31	163	1018.31	163
13															1018.14	82	1017.86	31	1017.84	29	1018.35	177	1018.29	157
14															1017.77	22	1017.61	12	1017.72	20	1018.29	157	1018.14	105
15															1017.73	17	1017.63	14	1017.87	31	1018.29	157	1018.29	155
16													1018.10	72	1017.80	25	1017.62	13	1017.86	31	1018.32	166	1018.27	142
17													1018.10	72	1017.66	16	1017.64	14	1017.87	31	1018.27	142	1018.17	112
18													1017.85	30	1017.63	14	1017.66	16	1017.93	40	1018.31	163	1018.10	93
19													1017.82	27	1017.64	14	1017.73	20	1017.93	40	1019.31	577	1018.25	142
20													1017.66	16	1017.73	17	1017.79	24	1017.91	37	1019.39	627	1018.31	163
21													1017.77	22	1017.60	12	1017.72	19	1018.10	72	1019.27	563	1018.10	93
22													1017.72	19	1017.85	30	1017.70	18	1018.12	75	1019.00	442	1018.23	134
23													1017.82	27	1017.94	40	1017.73	20	1018.11	74	1019.46	650	1018.40	197
24													1017.83	28	1017.77	22	1017.83	28	1018.27	121	1019.06	468	1018.33	170
25													1017.77	22	1017.81	26	1017.73	20	1018.22	106	1018.96	425	1018.06	83
26													1017.79	24	1017.80	25	1017.88	32	1017.99	48	1018.79	352	1018.29	155
27													1017.64	14	1017.79	24	1017.83	28	1018.12	75	1018.62	282	1018.21	128
28													1017.65	15	1017.77	22	1017.68	17	1018.20	100	1018.54	251	1018.18	117
29													1017.70	18	1017.95	42	1017.87	31	1018.13	75	1018.50	235	1018.18	117
30													1017.68	17	1017.73	17	1017.79	24	1018.23	109	1018.33	170	1018.20	125
31													1017.80	25	1017.57	11			1018.10	72			1018.18	117

Daily Gauge Height and Discharge of Grand River at Conestogo for 1914

Drainage Area 538 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1018.10	93	1020.46	1200	1019.23	70	1021.92	2130	1019.33	590	1017.98	65
2	1018.10	93	1020.25	875	1019.22	70	1022.87	2760	1018.83	370	1018.08	88
3	1018.14	105	1020.18	530	1019.29	70	1021.62	1920	1018.66	300	1018.06	83
4	1018.10	93	1019.96	390	1019.32	70	1020.54	1250	1018.58	267	1018.00	68
5	1017.96	100	1019.79	340	1019.33	70	1020.00	935	1018.52	243	1017.98	65
6	1018.16	110	1019.71	315	1019.31	70	1019.58	707	1018.53	247	1017.87	45
7	1018.23	135	1019.96	320	1019.39	70	1019.33	590	1018.77	345	1017.79	36
8	1018.25	143	1019.73	315	1019.32	70	1019.37	608	1018.96	425	1018.06	83
9	1018.14	105	1019.71	315	1019.23	70	1019.18	522	1018.75	338	1017.94	57
10	1018.14	105	1019.60	275	1019.34	50	1019.06	468	1018.52	243	1018.01	70
11	1018.14	105	1019.52	195	1019.31	45	1019.16	513	1018.49	233	1017.98	65
12	1018.14	105	1019.50	150	1019.33	75	1019.16	513	1018.50	235	1017.87	45
13	1018.25	100	1019.46	100	1019.31	93	1019.08	477	1018.51	240	1017.79	36
14	1018.42	87	1019.37	70	1019.35	140	1018.96	425	1018.42	205	1017.68	25
15	1018.39	73	1019.37	70	1019.52	675	1019.09	483	1018.42	205	1017.92	53
16	1018.50	87	1019.37	70	1020.96	1500	1019.20	532	1018.31	163	1017.64	23
17	1018.58	100	1019.42	70	1023.16	2960	1019.20	532	1018.14	105	1017.67	25
18	1018.46	87	1019.37	70	1021.29	1710	1019.18	523	1018.18	117	1017.68	25
19	1018.44	77	1019.37	70	1020.60	1290	1019.29	573	1018.23	135	1017.75	33
20	1018.48	77	1019.37	70	1019.96	910	1019.79	818	1018.06	83	1017.73	30
21	1018.52	93	1019.33	70	1019.92	890	1019.62	727	1018.12	98	1017.66	25
22	1018.59	90	1019.25	70	1019.66	748	1019.44	640	1018.00	68	1017.87	45
23	1018.64	87	1019.20	70	1019.16	513	1019.12	495	1018.16	110	1017.77	35
24	1018.75	110	1019.24	70	1019.08	477	1018.92	408	1017.94	57	1017.76	33
25	1018.75	125	1019.25	70	1019.29	575	1018.85	378	1018.08	88	1017.73	30
26	1018.77	135	1019.12	70	1021.00	1530	1019.16	513	1018.02	73	1017.75	33
27	1018.92	115	1018.83	70	1025.92	4800	1019.14	505	1018.04	78	1017.73	30
28	1019.04	280	1019.25	45	1023.92	3470	1018.87	388	1018.04	78	1017.68	25
29	1019.27	563	....	....	1022.54	2540	1018.89	395	1018.02	73	1017.94	57
30	1019.75	795	....	....	1023.87	3430	1019.54	687	1018.12	98	1017.85	45
31	1020.83	1420	....	....	1022.83	2730	....	....	1017.77	35	....	....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1017.73	30	1017.66	25	1017.94	57	1017.73	30	1017.94	57	1019.73	783
2	1017.68	25	1017.58	18	1018.31	163	1017.79	35	1017.94	57	1019.79	817
3	1017.77	33	1017.66	25	1018.27	150	1017.79	35	1017.94	57	1019.60	716
4	1017.87	45	1017.62	20	1018.29	157	1017.64	23	1017.98	65	1019.31	582
5	1017.71	28	1017.64	23	1018.18	117	1017.68	25	1017.96	61	1018.96	425
6	1017.81	38	1017.58	18	1017.92	53	1017.75	30	1018.06	83	1018.50	235
7	1017.79	35	1017.62	20	1018.18	117	1017.76	32	1017.98	65	1018.52	244
8	1017.79	35	1017.66	25	1018.14	105	1017.73	30	1017.87	45	1018.39	193
9	1017.77	33	1017.54	15	1018.16	110	1017.77	33	1017.79	36	1018.44	212
10	1017.64	23	1017.66	25	1018.12	98	1017.80	37	1017.87	45	1018.54	251
11	1017.58	18	1017.58	18	1017.92	53	1017 87	45	1017.94	57	1018.62	251
12	1017.79	35	1017.70	28	1018.00	68	1017.68	25	1018.00	68	1018.52	212
13	1017.71	28	1017.75	30	1017.83	42	1018.02	73	1018.27	150	1018.35	135
14	1017.85	43	1017.79	35	1017.79	35	1018.08	88	1018.35	176	1018.35	135
15	1017.81	38	1017.66	25	1017.79	35	1018.14	105	1018.20	125	1018.43	150
16	1017.77	33	1017.62	20	1017.77	33	1017.98	65	1018.85	377	1018.58	189
17	1017.73	30	1017.60	20	1517.73	30	1018.04	78	1018.94	416	1018.48	137
18	1017.68	25	1017.66	25	1017.73	30	1017.92	53	1018.46	220	1018.37	91
19	1017.62	20	1017.85	43	1017.66	24	1017.92	53	1018.66	300	1018.46	102
20	1017.68	25	1018.02	73	1017.68	25	1017.96	61	1018.37	185	1018.46	91
21	1017.61	20	1018.20	125	1017.66	24	1017.96	61	1018.46	220	1018.58	114
22	1017.57	18	1018.04	78	1017.66	24	1017.94	57	1018.27	150	1018.67	131
23	1017.64	23	1018.02	73	1017.73	30	1017.89	47	1018.37	185	1018.66	113
24	1017.68	25	1018.02	73	1017.87	45	1017.92	53	1018.64	292	1018.66	102
25	1017.64	23	1017.92	53	1017.87	45	1017.85	45	1018.42	205	1018.33	38
26	1017.61	20	1017.90	50	1017.79	35	1017.75	32	1018.50	235	1018.37	38
27	1017.62	20	1017.92	53	1017.58	18	1017.75	32	1018.56	259	1018.61	65
28	1017.68	25	1017.83	42	1017.68	25	1017.73	30	1019.25	555	1018.60	65
29	1017.66	25	1017.85	45	1017.71	28	1017.89	47	1019.12	496	1018.71	70
30	1017.64	23	1017.75	32	1017.83	42	1017.96	61	1019.25	555	1018.66	75
31	1017.62	20	1017.79	35	....	....	1018.14	105	....	....	1018.75	80

Monthly Discharge of Grand River at Conestogo for 1913

Drainage Area, 538 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	82	10	28	.15	.02	.05	.06
September	43	12	21	.21	.02	.04	.04
October	121	16	46	.22	.03	.09	.10
November	650	46	236	1.21	.09	.44	.49
December	258	83	152	.48	.15	.28	.32
The period	650	10	97	1.22	.02	.18	1.01

Monthly Discharge of Grand River at Conestogo for 1914

Drainage Area 538 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	1,420	73	187	2.64	.14	.35	.40
February	1,200	45	226	2.23	.08	.42	.44
March	4,800	45	1,025	8.93	.08	1.91	2.20
April	2,760	378	747	5.13	.70	1.39	1.55
May	590	35	192	1.10	.07	.36	.41
June	88	23	45	.16	.04	.09	.10
July	45	18	27	.08	.03	.05	.06
August	125	15	38	.23	.03	.07	.08
September	163	18	59	.30	.03	.11	.12
October	105	23	49	.20	.04	.09	.10
November	555	36	193	1.03	.07	.36	.40
December	817	38	221	1.54	.07	.41	.47
The year	4,800	15	251	8.93	.03	.47	6.33

Grand River at Galt

Location—At the Concession Street bridge, in the Town of Galt, County of Waterloo.

Records Available—July 21st, 1913, to Dec. 31st, 1914.

Drainage Area—1,356 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on first left pier of bridge. Elev. of zero on gauge is 851.00, which has remained unchanged since established.

Channel—Solid rock bed.

Discharge Measurements—Made from the bridge for high flows, and during the low-water period at a permanent section located 150 feet upstream.

Floods—The flood of April, 1912, was the highest on record.

Control—The intermittent operation of the mill ¼ mile above causes serious fluctuations in the river stage at this section.

Winter Flow—Ice affects the relation between gauge height and discharge from December to the middle of March, winter measurements are made to determine this flow.

Accuracy—Discharge curve well defined for flows up to 6,000 sec.-ft. For flows above 6,000 sec.-ft. the data available are insufficient to definitely determine the discharge curve.

Observer—Charles Parker.

Discharge Measurements of Grand River at Galt in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 21....	Roberts, E	110	116	1.44	851.89	167	....
Aug. 20....	"	100	88	1.04	851.64	91	....
Sept. 16....	"	100	88	1.03	851.64	90	....
Oct. 23....	"	140	149	2.22	852.56	333	....
Nov. 21....	"	200	916	2.16	854.59	1984	....
Dec. 9....	"	180	574	.68	852.50	388	....
" 16....	"	150	175	2.93	852.68	515	....
1914							
Jan. 27....	"	140	157	2.73	852.73	428	....
Feb. 24....	"	145	200	1.42	852.42	286	....
Mar. 19....	"	179	1173	3.05	856.08	3584	....
" 28....	"	242	2215	7.21	860.64	15980	....
" 30....	"	199	1872	5.41	859.25	10140	....
April 1....	"	180	1513	4.12	857.75	6239	....
" 3....	"	180	1573	4.12	857.81	6482	....
" 3....	"	180	1570	4.07	357.81	6385	....
" 4....	"	170	1235	2.80	856.00	3462	....
" 24....	"	180	566	2.09	853.83	1187	....
June 1....	"	120	136	1.97	852.29	268	....
July 6....	"	139	202	.90	852.08	182	....
" 6....	"	139	202	.90	852.08	181	....
" 24....	"	136	171	.88	851.88	151	....
" 25....	"	136	179	.89	851.89	161	....
Aug. 7....	"	138	174	8.87	851.87	152	....
" 25....	"	143	215	1.27	852.14	274	....
Sept. 7....	"	143	217	1.17	852.18	253	....
" 18....	"	141	205	1.19	852.10	242	....
" 18....	"	141	220	1.07	852.18	235	....
Oct. 17....	"	144	211	1.02	852.15	215	....
" 17....	"	144	212	1.05	852.16	223	....
" 26....	"	138	184	1.06	851.92	195	....
" 26....	"	143	198	1.06	852.06	210	....
Nov. 16....	"	146	326	1.68	852.93	550	....

Daily Gauge Height and Discharge of Grand River at Galt for 1913

Drainage Area, 1,356 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1															851.68	108	851.73	123	851.85	160	852.15	237	852.72	470
2															851.65	100	851.77	135	851.93	190	852.08	215	852.66	440
3															851.63	90	851.77	135	851.95	200	852.20	253	852.75	485
4															851.71	118	851.77	135	851.81	148	852.26	275	852.61	417
5															851.65	199	851.75	130	851.64	95	852.27	277	852.62	423
6															851.65	100	851.71	118	851.04	230	852.17	242	852.46	353
7															851.64	95	851.73	123	851.95	200	852.06	204	852.52	378
8															851.71	118	851.71	118	851.97	210	852.19	251	852.39	323
9															851.79	140	851.69	112	852.00	220	852.42	337	852.50	370
10															852.26	318	851.67	107	851.93	190	852.96	600	852.58	403
11															852.33	340	851.64	95	851.87	170	853.08	670	852.54	387
12															852.08	240	851.65	100	851.64	95	852.69	455	852.41	333
13															852.04	230	851.60	80	852.02	228	852.62	423	852.48	360
14															852.00	220	851.62	90	851.98	215	852.73	475	852.37	315
15															851.89	175	851.64	95	852.02	228	852.67	445	852.48	246
16															851.88	170	851.64	95	851.95	200	852.52	377	852.68	450
17															851.75	130	851.73	123	852.02	228	852.50	370	852.50	370
18															851.75	130	851.79	140	851.99	215	852.39	323	852.37	315
19															851.73	123	851.85	160	851.91	185	852.64	431	852.31	295
20															851.64	95	851.83	150	851.87	170	855.42	2,715	852.14	233
21													851.89	172	851.69	110	851.81	148	852.18	280	854.50	1,750	852.28	282
22													851.91	185	851.87	170	851.85	160	852.23	305	854.12	1,420	852.14	233
23													851.85	160	851.85	160	851.91	185	852.27	318	854.16	1,470	852.10	220
24													851.77	135	851.87	170	851.83	150	852.45	390	854.33	1,600	852.25	272
25													851.81	148	851.83	150	851.73	123	852.46	395	853.77	1,170	852.28	282
26													851.77	135	851.76	135	851.91	185	852.38	360	853.50	985	852.12	226
27													851.75	130	851.83	150	851.69	112	852.33	340	853.28	840	852.14	233
28													851.81	148	851.87	170	851.60	80	852.29	325	853.04	645	852.14	233
29													851.79	140	851.79	140	851.83	150	852.33	340	852.89	560	852.16	239
30													851.76	135	851.81	148	851.98	215	852.33	340	852.70	460	852.16	239
31													851.71	118	851.79	140			852.39	365			852.23	265

Daily Gauge Height and Discharge of Grand River at Galt for 1914

Drainage Area, 1,356 Square Miles

Day	January		February		March		April		May		June	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	851.92	169	854.20	2250	852.37	215	857.75	6200	853.96	1300	852.27	278
2	852.04	202	853.50	950	852.79	215	859.25	9050	853.64	1053	852.29	285
3	852.00	190	853.75	950	852.39	220	857.79	6250	853.25	777	852.27	278
4	851.98	185	853.87	970	852.31	220	855.87	3260	853.12	696	852.33	300
5	852.18	246	853.54	950	852.41	230	855.00	2240	853.33	830	852.31	295
6	852.20	253	853.64	830	852.45	235	854.40	1650	853.35	843	852.17	242
7	852.12	227	853.42	450	852.33	235	854.06	1370	853.33	830	852.14	233
8	852.04	203	853.18	370	852.29	240	853.96	1300	853.31	815	852.32	297
9	852.00	190	852.92	230	852.25	240	853.77	1175	853.18	730	852.31	295
10	852.25	272	853.00	245	852.33	250	853.54	1010	853.00	622	852.25	272
11	852.06	208	853.00	245	852.45	255	853.52	995	852.89	553	852.27	278
12	852.42	337	852.73	150	852.33	255	853.46	950	852.92	578	852.20	253
13	852.54	340	852.73	150	852.22	260	853.39	900	852.92	578	851.96	180
14	852.44	345	852.68	140	852.22	260	853.33	830	852.81	520	851.81	137
15	852.35	307	852.50	220	852.92	575	853.23	765	852.75	485	852.17	242
16	852.18	246	852.39	255	852.89	560	853.29	875	852.58	403	852.12	228
17	852.06	207	852.48	270	855.98	3400	853.48	935	852.50	370	852.10	220
18	852.27	277	852.52	270	857.25	5350	853.48	935	852.47	355	852.09	217
19	852.23	265	852.48	255	856.00	3450	853.54	1010	852.52	378	851.99	187
20	852.10	220	852.48	235	854.83	2075	854.00	1330	852.52	378	851.69	105
21	852.16	240	852.44	220	854.37	1620	854.37	1650	852.33	300	851.73	115
22	852.27	279	852.56	235	854.12	1420	854.04	1350	852.35	307	852.14	233
23	852.10	220	852.58	270	854.00	1330	853.87	1220	852.16	239	852.16	239
24	852.14	233	852.37	286	853.70	1100	853.60	1050	852.23	269	852.12	228
25	852.42	337	852.31	255	853.65	1060	853.44	960	852.31	295	852.12	228
26	852.50	370	852.27	277	854.87	2100	853.81	1190	852.39	323	852.11	225
27	852.50	370	852.27	277	859.25	9025	853.87	1230	852.50	370	851.92	268
28	852.73	475	852.23	215	860.45	11700	853.68	1083	852.58	403	851.94	274
29	853.02	635	......	.....	859,08	8700	853.60	1023	852.42	337	852.16	240
30	855.58	2880	......	.....	858.95	8450	853.73	1120	852.29	285	852.04	203
31	854.92	2150	......	.....	859.70	10000	......	.....	852.23	265	......	.....

Day	July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	851.87	155	851.56	73	852.37	315	852.07	212	852.00	190	853.82	1200
2	852.20	252	851.54	70	852.59	407	852.02	197	852.02	197	854.42	1670
3	852.12	228	851.57	75	852.76	490	851.70	108	852.10	220	854.20	1490
4	852.03	198	852.00	190	852.54	387	851.63	91	852.12	228	853.82	1220
5	851.96	180	852.03	200	852.37	315	852.06	207	852.19	250	853.39	900
6	852.12	228	852.11	223	852.31	295	851.83	144	852.08	215	852.79	505
7	852.12	228	851.84	145	852.14	233	851.87	155	852.12	228	852.39	315
8	851.98	185	851.56	73	852.25	272	851.83	144	851.98	185	852.50	370
9	852.07	212	851.48	55	852.11	225	851.79	133	851.96	180	852.24	267
10	852.08	215	851.98	185	852.07	212	851.92	170	852.15	238	852.22	260
11	851.87	155	852.00	190	851.99	187	851.97	182	852.19	250	852.33	300
12	851.75	120	851.84	145	852.06	207	851.87	155	852.23	265	852.42	335
13	852.09	217	851.95	175	851.79	133	852.20	252	852.35	305	852.33	300
14	852.12	228	851.88	157	851.96	180	852.25	272	852.34	303	852.37	315
15	852.10	220	851.76	125	851.96	180	852.14	233	852.64	432	852.42	335
16	852.12	228	851.48	55	851.92	170	852.16	239	853.04	647	852.45	350
17	851.91	265	851.91	167	852.08	213	852.16	239	853.44	905	852.32	295
18	851.98	185	851.81	138	851.91	167	851.93	172	852.44	590	852.27	277
19	851.71	110	851.94	175	851.79	133	852.05	205	852.60	412	852.25	270
20	852,04	203	852.00	190	851.74	118	852.04	203	852.50	370	852.04	202
21	851.94	175	852,64	432	852.07	212	852.00	190	852.42	335	852.23	265
22	851.81	137	852.35	305	852.04	202	852.00	190	852.48	360	852.29	285
23	851.90	163	852.20	252	851.91	167	851.92	170	852.42	335	852.29	285
24	851.85	150	852.17	242	851.84	145	851.79	133	852.50	370	852.28	282
25	851.65	95	852.17	242	851.86	152	851.87	155	852.48	360	852.04	202
26	851.55	71	852.18	245	851.75	122	851.89	160	852.62	420	852.12	226
27	851.82	140	852.07	209	851.61	85	852.02	197	852.72	470	852.27	277
28	851.80	135	851.89	160	851.83	144	851.96	180	853.34	835	852.31	294
29	851.85	147	851.88	158	852.04	203	852.06	207	853.56	1025	852.35	307
30	851.91	167	851.76	125	851.95	178	852.08	215	853.47	930	852,37	315
31	851.74	118	852.05	205	......	.....	852.16	239	......	.....	852.44	345

Monthly Discharge of Grand River at Galt for 1913

Drainage Area, 1,356 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	340	90	154	.25	.07	.11	.13
September	215	80	129	.16	.06	.10	.11
October	395	95	243	.29	.07	.18	.21
November	2715	204	683	2.00	.15	.50	.56
December	485	220	326	.36	.16	.24	.28
The period	2715	80	307	2.01	.06	.23	1.29

Monthly Discharge of Grand River at Galt for 1914

Drainage Area, 1,356 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	2,880	169	422	2.12	.12	.31	.36
February	2,250	140	445	1.66	.10	.33	.34
March	11,700	215	2,428	8.63	.16	1.79	2.06
April	9,050	765	1,826	6.67	.56	1.35	1.51
May	1,300	239	531	.97	.18	.39	.45
June	300	105	236	.22	.08	.17	.19
July	265	71	178	.20	.05	.13	.15
August	432	55	174	.32	.04	.13	.15
September	490	85	215	.36	.06	.16	.18
October	272	91	185	.20	.07	.14	.16
November	1,025	180	402	.76	.13	.30	.33
December	1,670	202	460	1.23	.15	.34	.39
The year	11,700	55	626	8.63	.04	.46	6.27

Grand River at Glenmorris

Location—At the Glenmorris Bridge, in the Village of Glenmorris, Township of South Dumfries, County of Brant.

Records Available—Discharge measurements, Aug., 1912, to Dec., 1914. Daily gauge heights, July, 1913, to Dec., 1914.

Drainage Area—1,385 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on left bank. Elev. of zero on gauge is 801.00, which has remained unchanged since established.

Channel—Permanent for both banks. The stream bed, however, is slightly shifting under flood conditions.

Discharge Measurements—Made from the bridge, and at a permanent wading section December to the middle of March. Winter measurements are made to determine the flow during the low-water period.

Floods—A severe flood occurred in April, 1912, cutting the right bank away and greatly increasing the width of the channel.

Control—The nearest dam is at Galt, about 8 miles upstream, the operation of which does not cause noticeable fluctuations in the river stage at this section.

Winter Flow—Ice affects the relation between gauge height and discharge. Measurements are taken to determine this flow, but during the ice period the water flowed on top of the ice, making accurate readings impossible.

Observer—Minnie Anderson.

Discharge Measurements of Grand River at Glenmorris in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 22....	Roberts, E	267	430	1.86	802.36	418	....
Aug. 15....	"	267	440	.86	802.36	378	....
Sept. 19....	"	254	315	.46	802.26	145	....
Oct. 15....	"	254	350	.62	802.30	217	....
Nov. 20....	"	280	898	3.63	804.33	3249	....
Dec. 9....	"	272	470	.99	802.51	466	....
1914							
Jan. 26....	"	144	205	2.11	802.60	433	....
Mar. 20....	"	280	898	2.81	804.04	2522	....
April 3....	"	341	1,772	4.91	806.54	8449	....
" 30....	"	272	736	2.31	803.45	1699	....
May 19....	"	271	453	.97	802.64	442	....
" 30....	"	180	229	1.04	802.54	239	....
July 1....	"	155	134	1.02	802.29	138	....
" 1....	"	160	147	1.14	802.33	168	....
" 22....	"	157	135	1.02	802.29	138	....
" 22....	"	157	139	1.00	802.29	140	....
" 30....	"	151	115	.77	802.14	89	....
" 30....	"	151	119	.77	802.14	92	....
Aug. 8....	"	144	106	.67	802.10	71	....
" 8....	"	144	108	.64	802.10	69	....
" 22....	"	187	206	1.42	802.58	294	....
Sept. 9....	"	192	199	1.40	802.50	279	....
" 9....	"	192	190	1.31	802.47	248	....
" 23....	"	183	181	1.31	802.43	238	....
Oct. 10....	"	174	135	1.04	802.29	140	....
" 10....	"	174	132	1.04	802.29	137	....
" 10....	"	174	131	1.04	802.29	136	....
" 10....	"	174	134	1.04	802.29	139	....
" 16....	"	184	180	1.34	802.45	242	....
" 16....	"	187	199	1.41	802.50	279	....
" 21....	"	184	181	1.33	802.45	242	....
" 21....	"	184	180	1.34	802.45	241	....
Nov. 16....	"	191	283	2.07	802.91	588	....
" 16....	"	191	285	2.06	802.91	587	....
Dec. 5....	"	273	620	1.78	803.29	1105	....

Daily Gauge Height and Discharge of Grand River at Glenmorris for 1913

Drainage Area 1,385 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
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30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	.....	.....	802.28	190	802.32	230	802.25	160	802.44	290	802.75	670
2	.....	.....	802.28	190	802.28	190	802.30	220	802.40	250	802.79	720
3	.....	.....	802.28	190	802.28	190	802.28	190	802.34	195	802.75	670
4	.....	.....	802.28	190	802.28	190	802.24	150	802.39	235	802.75	670
5	.....	.....	802.26	170	802.28	190	802.20	100	802.46	310	802.67	570
6	.....	.....	802.22	130	802.28	190	802.28	190	802.44	290	802.62	505
7	.....	.....	802.22	130	802.28	190	802.30	220	802.38	230	802.66	560
8	.....	.....	802.20	100	802.28	190	802.33	240	802.39	235	802.62	505
9	.....	.....	802.24	150	802.27	180	802.32	230	802.59	465	802.64	530
10	.....	.....	802.49	430	802.26	170	802.30	220	802.89	860	802.58	450
11	.....	.....	802.61	575	802.28	190	Gauge destroyed by school children. Elevation varied very little.	.....	803.00	1010	802.58	450
12	.....	.....	802.45	380	802.28	190		.....	802.85	780	802.54	405
13	.....	.....	802.45	380	802.25	160		.....	802.73	640	802.37	235
14	.....	.....	802.45	380	802.23	135		.....	802.75	670	802.29	175
15	.....	.....	802.36	280	802.24	150		218	802.75	670	802.27	160
16	.....	.....	802.28	190	802.24	150		.....	802.66	560	802.23	130
17	.....	.....	802.28	190	802.26	170		.....	802.66	560	802.17	100
18	.....	.....	802.28	190	802.29	210		.....	802.60	480	802.17	100
19	.....	.....	802.28	190	802.26	170		.....	802.71	620	802.08	70
20	.....	.....	802.28	190	802.28	190		.....	803.79	2290	802.02	50
21	802.36	280	802.24	150	802.28	190		.....	804.04	2690	801.98	40
22	802.36	280	802.36	280	802.32	230	802.31	225	803.62	1960	801.83	20
23	802.34	250	802.36	280	802.32	230	802.39	310	803.62	1960	801.95	35
24	802.32	230	802.36	280	802.34	250	802.50	440	803.87	2390	802.00	45
25	802.32	230	802.36	280	802.33	240	802.50	440	803.50	1760	801.79	15
26	802.28	190	802.36	280	802.30	220	802.58	540	803.25	1376	801.71	10
27	802.28	190	802.36	280	802.30	220	802.50	440	803.12	1180	802.04	55
28	802.28	190	802.36	280	802.20	100	802.53	470	802.96	950	802.00	45
29	802.28	190	802.36	280	802.28	190	802.50	440	802.87	830	802.06	60
30	802.28	190	802.36	280	802.28	190	802.50	440	802.81	750	802.08	70
31	802.28	190	802.34	250	.....	.....	802.48	420	.....	.....	802.10	75

Daily Gauge Height and Discharge of Grand River at Glenmorris for 1914

Drainage Area 1,385 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	801.92	30	802.71	620	803.37	160	807.00	9680	803.25	1375	802.37	220	802.30	160	802.29	155	802.46	255	802.29	155	802.29	155	803.37	1200
2	801.92	30	803.08	1120	803.42	160	807.87	12600	803.25	1375	802.33	185	802.31	165	802.16	95	802.71	470	802.31	165	802.35	185	804.00	2400
3	801.87	20	803.06	1070	803.42	160	807.20	10250	803.16	1235	802.37	220	802.27	140	802.18	100	802.83	570	802.27	145	802.31	165	803.77	2000
4	801.92	30	803.08	1120	803.37	160	805.58	6000	803.20	1300	802.50	355	802.31	165	802.29	155	802.62	380	802.20	110	802.41	220	803.54	1550
5	801.87	20	803.16	1235	803.42	160	804.37	3330	803.20	1300	802.50	355	802.30	160	802.29	155	802.54	320	802.33	175	802.35	185	803.23	1020
6	802.10	75	803.29	1430	803.37	160	803.29	1430	803.20	1300	802.50	355	802.20	110	802.27	145	802.54	320	802.31	165	802.31	165	803.00	740
7	802.08	70	803.31	1300	803.37	160	803.16	1235	803.16	1235	802.37	220	802.29	155	802.25	130	802.46	255	802.23	120	802.33	175	802.50	290
8	801.98	40	803.66	1160	803.25	160	803.08	1125	803.20	1300	802.48	330	802.34	180	802.26	135	802.46	255	802.20	110	802.33	175	802.54	320
9	801.92	30	803.71	940	803.25	160	802.96	950	803.12	1185	802.46	310	802.29	155	802.13	85	802.42	225	802.27	145	802.35	185	802.56	330
10	801.95	35	803.26	670	803.29	160	802.79	720	803.00	1000	802.37	220	802.24	125	802.30	160	802.42	225	802.27	145	802.35	185	802.60	360
11	802.12	80	806.33	530	803.25	160	802.79	720	802.92	895	802.37	220	802.25	130	802.25	130	802.39	210	802.29	155	802.44	235	802.68	360
12	802.68	580	806.02	600	803.33	160	802.79	720	802.96	950	802.37	220	802.24	125	802.25	130	802.27	140	802.33	175	802.35	185	802.75	350
13	802.52	380	806.18	700	803.33	160	802.66	560	802.96	950	802.33	185	802.31	165	802.29	155	802.27	140	802.42	225	802.39	210	802.71	355
14	802.29	155	805.50	750	803.42	160	802.66	560	802.92	895	802.27	160	802.29	155	802.25	130	802.33	175	802.46	255	802.44	235	802.83	340
15	802.46	310	805.29	750	803.66	2025	802.62	480	802.75	670	802.29	180	802.30	160	802.21	115	802.33	175	802.39	210	802.62	380	803.04	318
16	802.52	380	804.87	670	804.42	1630	802.66	560	802.75	670	802.29	180	802.30	160	802.17	100	802.25	130	802.44	235	802.87	610	803.06	315
17	802.42	280	804.77	530	806.74	8950	802.87	830	802.62	480	802.29	180	802.33	175	802.24	125	802.29	155	802.39	210	803.20	980	802.98	322
18	802.35	200	804.67	400	806.50	8320	802.87	830	802.58	450	802.29	180	802.30	160	802.27	145	802.27	145	802.33	175	803.12	808	802.98	322
19	802.38	220	804.54	300	805.66	6200	802.83	780	802.56	420	802.29	180	802.30	160	802.33	175	802.29	155	802.39	210	802.79	530	803.00	320
20	802.44	270	804.42	220	804.00	2630	803.12	1185	802.50	355	802.25	140	802.26	135	802.31	165	802.16	100	802.35	185	802.62	380	803.12	308
21	802.35	200	804.29	160	803.50	1760	803.42	1630	802.50	355	802.23	130	802.29	155	802.50	290	802.31	165	802.43	230	802.54	320	803.10	310
22	802.44	270	804.20	160	803.46	1695	803.20	1300	802.46	310	802.29	180	802.20	110	802.51	290	802.31	165	802.35	185	802.50	290	803.20	300
23	802.44	270	803.92	160	803.42	1625	803.25	1370	802.42	270	802.35	220	802.26	135	802.46	255	802.34	180	802.37	195	802.56	330	803.18	304
24	802.50	355	803.79	160	803.08	1125	802.83	780	802.42	270	802.35	220	802.25	130	802.40	215	802.33	175	802.37	195	802.60	360	803.20	300
25	802.56	410	803.66	160	803.50	1760	802.75	670	802.54	405	802.35	220	802.31	165	802.35	185	802.33	175	802.29	155	802.60	360	803.27	290
26	802.60	480	803.58	160	803.60	1760	802.83	780	802.50	355	802.33	200	802.20	110	802.33	175	802.31	165	802.35	185	802.54	320	803.27	290
27	802.64	510	803.62	160	808.46	14650	803.00	1000	802.50	355	802.27	160	802.18	100	802.31	165	802.20	110	802.35	185	802.77	510	803.27	290
28	802.71	600	803.46	160	809.46	18550	802.83	780	802.54	405	802.31	190	802.26	135	802.29	155	802.23	120	802.36	190	803.23	1020	803.27	290
29	803.12	1140	.....	.....	808.20	13750	802.92	895	802.48	330	802.37	235	802.23	120	802.33	175	802.29	155	802.39	195	803.27	1070	803.31	287
30	804.04	2700	.....	.....	807.46	11450	802.83	780	802.46	310	802.27	160	802.22	115	802.29	155	802.27	145	802.39	210	803.23	1020	803.35	285
31	804.06	2730	.....	.....	809.20	17500	.....	.....	802.42	270	.....	.....	802.25	130	802.31	165	.....	.....	802.37	195	.....	.....	803.31	287

Monthly Discharge of Grand River at Glenmorris for 1913

Drainage Area, 1,385 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	575	100	249	.42	.07	.18	.21
September	250	100	189	.18	.07	.14	.16
October	540	100	274	.39	.07	.20	.23
November	2,690	195	916	1.94	.14	.66	.73
December	720	10	264	.52	.01	.19	.22
The period	2.690	10	378	1.94	.01	.27	1.55

Monthly Discharge of Grand River at Glenmorris for 1914

Drainage Area, 1,385 Square Miles

Month.	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	2,730	20	416	1.97	.01	.30	.35
February	1,430	160	621	1.03	.12	.45	.47
March	18,550	160	3,797	13.39	.12	2.74	3.16
April	12,600	480	2,151	9.10	.35	1.55	1.73
May	1,375	270	741	.99	.19	.54	.62
June	355	130	217	.26	.09	.16	.18
July	180	100	143	.13	.07	.10	.12
August	290	95	158	.21	.07	.11	.13
September	570	100	212	.41	.07	.15	.17
October	255	110	180	.18	.08	.13	.15
November	1,070	155	398	.77	.11	.29	.32
December	2,400	285	540	1.73	.21	.39	.45
The year	18,550	20	800	13.39	.01	.58	7.85

Grand River at Brantford

Location—At the Toronto, Hamilton & Buffalo Ry. bridge, in the City of Brantford, County of Brant.

Records Available—Discharge measurements, Aug., 1912, to Dec., 1914. Daily gauge heights, July, 1913, to Dec. 31st, 1914.

Drainage Area—1,991 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on left abutment. Elev. of zero on gauge is 643.00, which has remained unchanged since established.

Channel—Permanent under ordinary conditions.

Discharge Measurements—From the bridge at all stages.

Floods—In April, 1912, a severe flood occurred. It reached the top of the dyke which protects West Brantford.

Control—The river stage at this cross-section is affected by the Western Counties dam, located 1,200 feet above this station. The extent of the effect is hard to determine, as the power plant when operating does not use a uniform flow. At the present time the plant is used for peak purposes only, and the gauge recorder's evening reading is likely to be taken when the turbines are running very low. This condition of course will show a greater mean gauge height than has really existed.

Winter Flow—The relation between gauge height and discharge is affected by ice from late December to about the middle of March. Winter readings are made to determine the winter discharge. Anchor ice prevented readings after first week in February, 1914.

Observer—John Anguish.

Discharge Measurements of Grand River at Brantford in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
Aug. 13....	Roberts, E	238	628	.94	644.67	595	....
Sept. 8....	"	203	592	.63	644.37	373	....
Oct. 15....	"	215	357	.99	644.25	354	....
Nov. 13....	"	248	803	1.05	645.04	845	....
Dec. 8....	"	248	766	1.00	644.93	764	....
1914							
Jan. 20....	"	188	491	.83	644.81	409	....
Mar. 19....	"	373	2152	3.69	648.77	7954	....
" 29....	"	373	2578	4.87	650.04	12538	....
" 31....	"	373	3275	4.98	651.68	16328	....
April 2....	"	373	2449	4.41	649.71	10798	....
" 8....	"	281	1004	2.43	646.15	2443	....
" 24....	"	281	844	1.79	645.62	1519	....
May 23....	"	188	636	.91	644.67	598	....
" 26....	"	203	837	1.01	644.93	845	....
" 29....	"	220	616	.69	644.62	430	....
June 29....	"	170	704	.68	644.50	480	....
July 21....	"	203	657	.51	644.35	336	....
" 23....	"	203	655	.35	644.21	233	....
" 29....	"	198	611	.31	644.00	187	....
" 23....	"	203	675	.41	644.28	281	....
" 29....	"	198	611	.30	644.00	186	....
Aug. 6....	"	228	663	.49	644.32	323	....
" 13....	"	198	580	.20	643.83	116	....
" 27....	"	188	643	.45	644.34	289	....
" 27....	"	188	652	.55	644.42	359	....
" 28....	"	188	616	.37	644.16	231	....
" 28....	"	188	643	.50	644.34	318	....
Nov. 4....	"	188	681	.73	644.55	496	....
" 4....	"	188	681	.70	644.54	475	....
" 5....	"	188	681	.66	644.50	451	....
" 5....	"	188	681	.71	644.58	485	....
" 19....	"	281	857	1.15	645.09	985	....
" 19....	"	281	857	1.19	645.10	1018	....
Dec. 3....	"	281	1191	2.31	646.28	2748	....

Daily Gauge Height and Discharge of Grand River at Brantford for 1913

Drainage Area, 1991 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1															644.21	250	644.36	430	644.32	335	644.75	660	645.00	915
2															644.15	210	644.36	430	644.44	415	644.75	660	644.83	740
3															644.21	250	644.32	335	644.48	445	644.62	550	645.04	960
4															644.36	355	644.36	430	644.42	400	644.62	550	644.96	865
5															644.28	285	644.34	340	644.36	355	644.75	660	644.96	865
6															644.30	315	644.28	300	644.48	445	644.73	640	644.94	830
7															644.34	340	644.26	280	644.44	400	644.58	525	644.92	820
8													644.61	540	644.32	335	644.37	370	644.46	430	644.75	660	644.75	660
9													644.55	500	644.44	415	644.32	335	644.48	445	644.73	640	644.75	660
10													644.51	520	644.67	580	644.34	340	644.44	415	645.12	1050	644.75	660
11													644.53	485	644.92	820	644.30	315	644.40	380	645.14	1080	644.93	835
12													644.55	500	644.71	630	644.30	315	644.46	430	645.12	1050	644.87	770
13													644.53	485	644.67	580	644.17	230	644.42	400	644.96	865	644.68	600
14													644.55	500	644.55	500	644.17	230	644.52	480	644.98	880	644.79	690
15													644.54	495	644.49	450	644.27	290	644.25	275	645.04	960	644.60	530
16													644.51	460	644.44	415	644.30	315	644.46	430	645.10	1025	644.64	570
17													644.57	520	644.38	375	644.28	300	644.46	430	645.00	915	644.67	585
18													644.51	460	644.44	415	644.28	300	644.54	490	644.96	865	644.71	630
19													644.42	400	644.36	355	644.34	340	644.44	415	645.04	960	644.79	690
20													644.44	415	644.38	375	644.28	300	644.60	535	646.23	2735	644.79	690
21													644.53	485	644.34	340	644.30	315	644.65	570	647.42	5065	644.64	570
22													644.46	430	644.48	445	644.34	340	644.56	515	646.52	3260	644.58	525
23													644.53	485	644.48	445	644.34	340	644.67	590	646.21	2700	645.19	1140
24													644.48	435	644.44	415	644.38	375	644.79	690	646.71	3620	644.67	585
25													644.44	415	644.53	485	644.36	355	645.00	915	646.20	2680	644.87	770
26													644.44	415	644.38	375	644.34	340	644.94	840	645.83	2080	644.83	740
27													644.32	335	644.36	355	644.30	315	644.85	750	645.60	1725	644.75	660
28													644.42	400	644.40	380	644.32	335	644.83	730	645.39	1425	644.68	600
29													644.42	400	644.46	430	644.36	355	644.81	705	645.25	1225	644.67	585
30													644.44	415	644.36	355	644.28	300	644.79	690	645.12	1050	644.73	640
31													644.38	375	644.40	380			644.73	645			644.62	550

Daily Gauge Height and Discharge of Grand River at Brantford for 1914

Drainage Area, 1,991 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	644.58	525	646.83	3840	645.31	1315	649.46	9995	645.98	2315	644.40	380	644.27	290	644.06	165	644.37	360	644.29	305	644.50	460	645.60	1720
2	644.56	515	646.20	2680	645.16	1110	649.87	11100	645.79	2015	644.29	305	644.29	305	643.81	30	645.04	950	644.29	305	644.50	460	646.27	2810
3	644.58	525	646.10	2515	645.25	1225	650.08	11700	645.52	1610	644.37	360	644.25	275	644.14	205	645.04	950	644.20	240	644.50	460	646.29	2840
4	644.54	495	646.16	2615	645.42	1460	648.18	6800	645.37	1380	644.46	430	644.27	290	644.25	275	644.81	705	644.08	175	644.46	430	645.98	2315
5	644.58	525	646.04	2420	645.33	1335	647.16	4500	645.23	1190	644.50	460	644.23	265	644.14	205	644.68	600	644.25	275	644.50	460	645.58	1700
6	644.66	585	645.58	1685	645.37	1380	646.58	3375	645.10	1025	644.56	505	644.33	340	644.16	225	644.60	535	644.25	275	644.50	460	645.29	1270
7	644.58	525	645.46	1515	645.37	1380	646.20	2680	645.23	1190	644.48	450	644.31	325	644.06	165	644.46	425	644.29	305	644.54	495	645.04	960
8	644.62	550	645.33	1330	645.31	1315	646.29	2840	645.79	2015	646.10	2515	644.23	265	644.08	175	644.44	415	644.29	305	644.33	340	644.87	775
9	644.58	525	645.08	1010	645.31	1315	645.89	2170	645.54	1630	645.66	1820	644.31	325	643.85	50	644.42	405	644.20	240	644.46	430	644.87	775
10	644.54	495	645.08	1010	645.25	1225	645.71	1895	645.35	1350	645.02	935	644.29	305	643.92	70	644.39	375	644.10	175	644.42	400	644.71	630
11	644.58	525	645.50	1575	645.20	1150	645.46	1520	645.12	1050	644.79	690	644.04	140	644.10	175	644.31	325	644.04	140	644.48	450	644.87	775
12	644.50	465	646.00	2350	645.18	1135	645.62	1750	645.12	1050	644.58	530	643.92	70	644.04	140	644.16	225	644.18	230	644.50	460	644.75	660
13	644.50	465	645.92	2220	645.20	1150	645.42	1455	645.16	1110	644.52	480	644.25	275	644.08	175	644.12	190	644.18	230	644.56	505	644.79	690
14	654.56	515	645.71	1900	645.33	1335	645.37	1380	645.14	1075	644.35	350	644.25	275	644.14	205	644.20	240	644.33	340	644.54	495	644.66	575
15	644.75	660	645.73	1925	645.52	1670	645.33	1330	645.00	915	644.31	325	644.25	275	644.04	140	644.16	225	644.50	450	644.58	525	644.46	430
16	644.71	630	645.66	1810	646.65	3560	645.37	1380	644.96	865	644.23	265	644.25	275	643.92	70	644.12	190	644.54	495	644.75	660	644.66	550
17	644.58	525	645.66	1810	647.50	5245	645.42	1460	644.87	770	644.25	275	644.25	275	644.00	120	644.12	190	644.60	535	645.20	1150	644.92	780
18	644.66	585	645.64	1780	648.96	8665	645.48	1550	644.75	660	644.08	170	644.21	250	644.02	130	644.10	175	644.48	435	645.18	1130	644.92	700
19	644.83	740	645.54	1635	648.58	7700	645.48	1550	644.75	660	644.12	190	644.21	250	644.08	175	643.98	105	644.52	470	644.98	880	644.96	600
20	644.79	690	645.46	1520	647.54	5330	645.66	1810	644.71	630	644.21	250	644.19	245	644.23	265	643.92	70	644.46	430	644.87	775	644.87	600
21	644.75	660	645.37	1380	646.66	3525	646.18	2660	644.79	690	644.16	225	644.25	275	644.20	240	644.00	120	644.46	430	644.75	660	644.92	500
22	644.71	630	645.25	1225	646.66	3525	646.00	2350	644.71	630	644.18	240	644.13	200	644.60	535	644.08	175	644.46	430	644.83	730	644.96	400
23	644.83	740	645.42	1460	646.23	2735	645.79	2015	644.62	550	644.20	250	644.13	200	644.46	430	644.16	225	644.40	380	644.85	750	644.92	350
24	644.77	670	645.35	1360	646.04	2415	645.62	1750	644.58	525	644.23	265	644.13	200	644.35	350	644.10	175	644.37	360	644.83	730	644.98	325
25	644.94	830	645.31	1315	645.92	2220	645.46	1520	644.62	550	644.20	250	644.00	120	644.31	325	644.42	405	644.31	325	644.75	660	644.96	320
26	645.04	960	645.23	1190	646.29	2830	645.12	1050	644.71	630	644.18	240	643.96	100	644.14	205	644.20	240	644.39	375	644.83	730	644.87	300
27	645.14	1080	645.20	1150	649.46	9995	646.08	2490	644.77	670	644.27	290	644.12	190	644.33	340	644.25	275	644.37	360	644.87	775	644.87	300
28	645.25	1225	645.16	1110	652.66	19370	645.83	2080	644.79	690	644.31	325	644.19	245	644.33	340	644.25	275	644.37	360	645.20	1150	645.04	250
29	645.58	1685	.....	.....	651.33	15280	645.62	1750	644.62	550	644.39	375	644.19	245	644.16	225	644.33	340	644.44	415	645.60	1720	645.04	250
30	646.37	2990	.....	.....	649.66	10515	645.66	1810	644.62	550	644.44	415	644.06	165	644.06	165	644.33	340	644.50	450	645.54	1640	645.04	250
31	647.62	5520	.....	.....	651.92	1790	.....	.....	644.44	415	.....	.....	644.08	175	644.14	205	.....	.....	644.44	360	.....	.....	645.04	250

Monthly Discharge of Grand River at Brantford for 1913

Drainage Area 1,991 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	540	335	953	.27	.17	.23	.20
August	820	210	408	.41	.11	.20	.23
September	430	230	330	.22	.12	.17	.19
October	915	275	516	.46	.14	.26	.30
November	5,065	525	1,426	2.54	.26	72	.80
December	1,140	525	707	.57	.26	.36	.41
The period	5,065	210	645	2.54	.11	.32	2.13

Monthly Discharge of Grand River at Brantford for 1914

Drainage Area, 1991 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
January	5,520	465	904	2.77	.23	.45	.52
February	3,840	1,010	1,760	1.93	.51	.88	.92
March	19,370	1,110	4,015	9.73	.56	2.02	2.33
April	11,700	1,050	3,057	5.88	.53	1.54	1.72
May	2,315	415	998	1.16	.21	.50	.58
June	2,515	170	485	1.26	.09	.24	.27
July	340	70	240	.17	.04	.12	.14
August	535	30	211	.27	.02	.11	.13
September	950	70	341	.48	.04	.17	.19
October	535	140	342	.27	.07	.17	.20
November	1,720	340	699	.86	.17	.35	.39
December	2,840	250	827	1.43	.13	.42	.48
The year	19,370	30	1,151	9.73	.02	.58	7.87

Grand River at York

Location—At the highway bridge in the Village of York, Township of Oneida, County of Haldimand.

Records Available—June 25th, 1913, to Dec. 31st, 1914.

Drainage Area—2,311 square miles.

Gauge—Vertical staff, 0 ft.—6 ft. on the first pier from left bank and 6 ft.—12 ft. on the left abutment. The elev. of zero on the gauge is 593.00, and has remained unchanged since established.

Channel—Small stones form the bed of this stream, which shifts during flood periods, changing conditions of control below section.

Discharge Measurements—These are taken from the highway bridge, and at a permanent low-water section located 800 feet above the bridge during the low-water period.

Floods—An exceptionally severe flood occurred in April, 1912, the river rising to a gauge height of 606.00, which indicates a flow of over 100,000 second feet. The dam below the bridge was wrecked, the water cutting around the right abutment and greatly increasing the width of the channel.

Control—The nearest dam is 5 miles upstream, at Caledonia. The intermittent operation of the mill located here causes fluctuations in the flow at this section.

Winter Flow—From December to March the relation between gauge height and discharge is affected by ice. Measurements were made to determine the winter flow, but from February to the spring break-up anchor ice prevented further meter readings during the winter.

Accuracy—With the exception of the variations in gauge height, caused through the operation of the plant at Caledonia, the measurements here are fair.

Observer—Stanley Brown.

Discharge Measurements of Grand River at York in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
June 25....	Roberts, E	300	563	1.00	593.98	563	....
Aug. 19....	"	295	542	1.04	393.97	565	....
Sept. 11....	"	289	414	.87	393.69	363	....
Oct. 13....	"	265	314	1.00	593.65	314	....
Nov. 6....	"	285	536	.92	593.96	491	....
Dec. 10....	"	321	1189	.62	594.15	738	....
1914							
Jan. 19....	"	290	425	1.06	593.92	453	....
Mar. 28 (a)	"	397	3529	7.38	600.17	260	....
April 1....	"	387	2634	4.63	598.00	12213	....
" 6....	"	379	1892	2.09	596.04	3969	....
" 7....	"	379	1876	1.71	595.67	3207	....
June 8....	"	270	614	1.16	594.10	716	....
" 16....	"	273	548	.94	593.75	517	....
" 23....	"	277	402	1.16	593.71	468	....
July 14....	"	245	309	1.12	593.42	346	....
" 15....	"	245	290	1.08	593.37	313	....
Aug. 11....	"	237	236	1.04	593.11	247	....
" 11....	"	237	240	1.04	593.12	251	....
" 12....	"	237	244	1.01	593.12	246	....
" 12....	"	237	221	.98	593.00	218	....
Sept. 11....	"	270	385	1.25	593.63	483	....
" 12....	"	270	387	1.34	593.66	519	....
" 25....	"	275	374	1.18	593.56	443	....
" 25....	"	275	374	1.19	593.56	445	....
" 26....	"	274	360	1.17	593.51	419	....
" 26....	"	274	357	1.14	593.50	409	....
Oct. 8....	"	269	309	1.14	593.40	354	....
" 9....	"	260	300	1.07	593.39	320	....
" 22....	"	276	369	1.20	593.56	442	....
" 23....	"	278	383	1.18	593.58	451	....
Nov. 9....	"	279	391	1.18	593.62	462	....
" 9....	"	278	386	1.20	593.60	464	....
Dec. 10....	"	280	472	1.30	593.94	614	....
" 11....	"	280	493	1.25	593.94	615	....

(a) Ice conditions

Daily Gauge Height and Discharge of Grand River at York for 1913

Drainage Area, 2,311 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec ft.	Feet	Sec-ft.
1	...	...	...	...	...	...	...	...	...	...	...	...	593.90	500	593.50	275	593.71	370	593.73	385	594.23	750	594.52	1020
2	...	...	...	...	...	...	...	...	...	...	...	...	593.94	570	593.54	250	593.73	385	593.75	400	593.98	540	594.44	920
3	...	...	...	...	...	...	...	...	...	...	...	...	593.92	530	593.42	188	593.71	370	593.73	385	593.98	540	594.52	1000
4	...	...	...	...	...	...	...	...	...	...	...	...	593.90	500	593.46	205	593.67	350	593.52	235	593.96	530	594.48	950
5	...	...	...	...	...	...	...	...	...	...	...	...	593.90	500	593.46	205	593.91	295	593.50	225	594.00	555	594.39	880
6	...	...	...	...	...	...	...	...	...	...	...	...	594.00	600	593.48	210	593.65	338	593.46	205	594.00	555	594.39	880
7	...	...	...	...	...	...	...	...	...	...	...	...	594.14	709	593.50	225	593.62	300	593.44	190	593.96	530	594.35	820
8	...	...	...	...	...	...	...	...	...	...	...	...	594.04	635	593.50	225	593.65	338	593.58	275	593.94	525	594.39	880
9	...	...	...	...	...	...	...	...	...	...	...	...	594.02	610	593.50	225	593.64	329	593.60	285	593.85	455	594.27	750
10	...	...	...	...	...	...	...	...	...	...	...	...	593.98	570	593.44	215	593.61	291	543.65	338	594.46	950	594.21	700
11	...	...	...	...	...	...	...	...	...	...	...	...	593.98	570	593.56	265	593.61	291	593.63	315	595.00	1630	594.39	880
12	...	...	...	...	...	...	...	...	...	...	...	...	593.94	555	594.00	600	593.56	260	593.67	350	594.81	1400	594.52	1020
13	...	...	...	...	...	...	...	...	...	...	...	...	593.96	560	594.06	650	593.58	275	593.65	338	594.62	1150	594.48	950
14	...	...	...	...	...	...	...	...	...	...	...	...	593.94	550	593.98	585	593.58	275	593.76	410	594.54	1050	594.44	920
15	...	...	...	...	...	...	...	...	...	...	...	...	593.96	560	593.94	565	593.56	260	593.64	320	594.58	1100	594.29	800
16	...	...	...	...	...	...	...	...	...	...	...	...	593.96	560	593.90	500	593.56	260	593.58	275	594.64	1200	594.37	860
17	...	...	...	...	...	...	...	...	...	...	...	...	593.96	560	593.67	350	593.48	215	593.58	275	594.60	1120	594.44	920
18	...	...	...	...	...	...	...	...	...	...	...	...	593.88	490	593.71	370	593.50	225	593.60	285	594.64	1050	594.44	920
19	...	...	...	...	...	...	...	...	...	...	...	...	593.84	465	593.97	565	593.52	240	593.44	215	594.64	1200	594.45	960
20	...	...	...	...	...	...	...	...	...	...	...	...	593.71	370	593.71	370	593.52	240	593.62	300	595.02	1700	594.48	980
21	...	...	...	...	...	...	...	...	...	...	...	...	593.81	440	593.59	275	593.58	275	593.75	400	596.96	7500	594.52	1020
22	...	...	...	...	...	...	...	...	...	...	...	...	593.77	425	593.67	350	593.71	370	593.79	430	596.42	5300	594.52	1020
23	...	...	...	...	...	...	...	...	...	...	...	...	593.75	400	593.75	400	593.71	375	593.83	465	596.25	4700	594.44	920
24	...	...	...	...	...	...	...	...	...	...	...	...	593.71	370	593.61	295	593.73	385	593.88	500	596.21	4600	594.48	950
25	...	...	...	...	...	...	...	...	...	...	...	...	593.69	355	593.69	360	593.73	385	394.04	630	595.87	3550	594.50	1000
26	...	...	...	...	...	...	...	...	...	...	...	...	593.69	365	593.73	385	593.79	430	594.19	790	595.50	2600	594.44	920
27	...	...	...	...	...	...	...	...	...	...	...	...	593.65	338	593.71	370	593.82	455	594.27	860	595.21	2000	594.44	920
28	...	...	...	...	...	...	...	...	...	...	...	...	593.65	338	593.67	350	593.79	430	594.19	790	594.93	1550	594.44	920
29	...	...	...	...	...	...	...	...	...	...	...	...	593.59	275	593.65	338	593.75	400	594.12	705	594.68	1250	594.35	850
30	...	...	...	...	...	...	...	...	...	...	...	...	593.54	240	593.62	300	593.77	415	594.12	705	594.54	1050	594.37	860
31	...	...	...	...	...	...	...	...	...	...	...	...	593.59	275	593.73	235	...	...	594.12	705	...	...	594.44	920

Daily Gauge Height and Discharge of Grand River at York for 1914

Drainage Area, 2,311 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	594.21	730	597.75	11050	594.73	385	598.54	15400	594.58	1100	593.83	440
2	594.12	640	596.42	5300	594.66	365	597.75	11000	594.50	1000	593.77	400
3	594.04	585	595.54	2700	594.75	360	598.50	15000	593.96	525	593.75	390
4	594.18	710	595.62	2800	594.75	410	597.46	9700	594.71	1220	593.81	420
5	594.16	685	595.54	2700	595.00	465	596.83	7000	594.98	1600	594.00	555
6	594.04	585	595.79	2800	595.16	515	596.08	4200	595.62	2880	594.00	555
7	594.04	585	595.71	2600	594.85	490	595.71	3100	596.52	5700	593.94	510
8	594.06	605	597.75	2100	594.77	450	595.56	2700	596.04	4100	594.58	1075
9	594.06	550	596.71	1700	594.42	400	595.25	2100	595.29	2180	595.29	2130
10	593.92	495	596.85	1400	594.68	385	595.12	1850	595.04	1700	594.79	1310
11	594.04	545	596.83	1200	593.87	360	595.06	1750	594.20	700	594.29	850
12	593.87	465	596.85	1100	593.62	320	594.08	615	594.29	800	594.12	755
13	593.81	430	596.66	960	593.62	315	594.06	600	594.54	1700	593.96	625
14	593.73	380	596.56	825	594.43	930	593.79	420	594.79	1400	593.75	500
15	593.75	390	596.46	700	596.00	3950	593.71	365	594.83	1450	593.96	625
16	593.73	380	596.54	605	596.54	5800	593.71	365	594.87	1500	593.63	430
17	593.85	450	596.23	675	597.00	7700	593.73	380	594.77	1300	593.62	430
18	593.81	430	596.87	770	599.16	19200	593.79	420	594.25	750	593.62	430
19	593.83	450	595.77	630	599.83	23900	593.71	365	594.16	680	593.73	490
20	593.87	465	595.60	515	597.96	12200	593.79	420	594.12	645	593.51	390
21	594.04	585	595.20	470	596.60	6000	594.71	1220	594.18	700	593.42	335
22	594.00	550	594.94	420	595.79	3300	595.16	1900	594.04	585	593.58	410
23	593.96	525	594.87	395	595.50	2600	594.71	1220	594.06	595	593.75	500
24	594.00	550	594.73	380	594.81	1350	594.12	645	594.00	550	593.75	500
25	593.92	495	594.79	360	594.50	1080	594.58	1100	593.96	525	593.62	430
26	594.04	545	594.81	350	594.87	1450	596.00	4000	594.00	550	593.62	430
27	594.46	960	594.79	350	596.12	4200	595.75	3200	594.00	550	593.56	400
28	594.62	1100	594.75	365	600.12	26000	595.44	2500	593.87	465	593.58	410
29	595.42	2500	......	.....	599.66	22570	595.33	2250	593.85	450	593.64	440
30	596.00	4000	......	.....	598.33	14200	595.04	1700	593.96	545	593.62	430
31	597.34	9100	......	.....	599.20	19500	......	.....	593.93	495	......	.....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	593.58	410	593.10	240	593.66	470	593.35	332	593.46	378	594.83	1400
2	593.62	435	593.10	240	594.16	760	593.35	332	593.54	413	595.27	2125
3	593.62	435	593.08	235	594.27	840	593.29	308	593.56	423	595.53	2775
4	593.60	420	593.08	235	594.18	775	593.33	323	593.60	440	595.31	2160
5	593.46	355	593.00	220	594.18	775	593.08	240	593.58	430	594.66	1180
6	593.54	390	592.92	200	594.00	650	593.43	360	593.52	405	594.54	1020
7	593.62	430	593.00	220	593.87	580	593.42	360	593.58	430	594.54	1020
8	593.62	430	593.00	220	593.79	538	593.33	323	593.56	423	594.46	985
9	593.64	440	593.00	220	593.68	480	593.31	315	593.54	435	594.27	840
10	593.54	390	593.00	220	593.64	460	593.25	293	593.50	395	594.00	650
11	593.54	390	593.04	230	593.62	450	593.08	240	593.50	395	593.96	585
12	593.52	380	593.06	235	593.58	432	593.37	340	593.56	423	593.85	510
13	593.37	320	593.13	250	593.54	413	593.42	360	593.62	450	593.81	485
14	593.35	310	593.12	245	593.54	413	593.44	370	593.64	460	593.78	445
15	593.42	335	593.04	230	593.44	370	593.56	423	593.68	480	593.92	500
16	593.54	390	593.04	230	593.42	360	593.62	450	593.81	550	594.12	586
17	593.46	355	593.12	245	593.42	360	593.62	450	594.25	825	594.62	890
18	593.46	355	593.16	255	593.37	340	593.62	450	594.50	1010	594.44	730
19	593.50	370	593.18	260	593.35	332	593.64	460	594.46	985	594.35	647
20	593.46	355	593.18	260	593.31	315	593.68	480	594.42	950	594.42	664
21	593.37	320	593.35	315	593.23	289	593.60	440	594.37	915	594.18	512
22	593.40	330	593.54	390	593.42	360	593.52	405	594.08	705	594.18	485
23	593.44	350	593.75	500	593.39	348	593.55	405	594.20	787	594.04	400
24	593.35	310	593.83	545	593.44	370	583.48	387	594.12	730	594.10	405
25	573.21	285	593.85	560	593.48	387	593.44	370	594.10	717	593.92	400
26	593.16	255	593.77	510	593.46	378	593.48	387	594.08	705	593.79	343
27	593.20	265	593.75	500	593.14	260	593.54	413	594.20	787	593.85	370
28	593.20	265	593.75	500	593.37	340	593.52	405	594.25	825	593.68	300
29	593.20	265	593.58	410	593.31	315	593.50	395	594.71	1250	593.66	293
30	593.16	255	593.50	395	593.33	323	593.54	413	594.75	1300	593.73	319
31	593.08	235	593.50	395	......	.....	593.48	387	......	.....	593.68	300

Monthly Discharge of Grand River at York for 1913

Drainage Area, 2,311 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	709	240	477	.31	.10	.21	.24
August	650	183	350	.28	.08	.15	.17
September	455	215	327	.20	.09	.14	.16
October	860	205	419	.37	.09	.18	.21
November	7,500	455	1,754	3.25	.20	.76	.84
December	1,020	700	913	.44	.30	.40	.46
The period	7,500	183	707	3.25	.08	.31	2.08

Monthly Discharge of Grand River at York for 1914

Drainage Area, 2311 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	9,100	380	1,015	3.94	.16	.44	.51
February	11,050	350	1,652	4.78	.15	.72	.74
March	26,000	315	5,848	11.25	.14	2.53	2.92
April	15,400	365	3,266	6.67	.16	1.41	1.57
May	5,700	450	1,255	2.47	.19	.54	.62
June	2,130	335	587	.92	.15	.25	.28
July	440	235	350	.19	.10	.15	.17
August	560	200	314	.24	.09	.14	.16
September	840	260	449	.36	.11	.19	.21
October	480	240	375	.21	.10	.16	.18
November	1,300	378	647	.56	.16	.28	.31
December	2,775	293	785	1.20	.13	.34	.39
The year	26,000	200	1,377	11.25	.09	.60	8.06

Irvine River near Salem

Location.—At the highway bridge known as Watt's Bridge on the third line between the 11th and 12th concessions, lot 14, Township of Nichol, County of Wellington.

Records Available.—Old section, July to October, 1913. Nov. 1st, 1913, to Oct. 31st, 1914, present section.

Drainage Area.—64 square miles.

Gauge.—Vertical staff, 0 ft.—9 ft. on centre pier. Elev. of zero on gauge is 1297.00, which has remained unchanged since established.

Channel.—Solid rock.

Discharge Measurement.—Made from bridge and permanent section located 100 feet above for the low-water period.

Floods.—The flood water is confined in channel, which is high and rocky.

Winter Flow.—During part of December, up to the middle of March, ice greatly affects the relation between gauge height and discharge. During February and March anchor ice affected this section, making the winter readings that were taken to determine the flow rather unreliable.

Control.—The river stage at this section is not affected by any dams, etc.

Accuracy.—The records here are good. The flow natural.

Observer.—Annie Barber.

Discharge Measurements of Irvine River near Salem in 1913-14

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 30....	Roberts, E	8	2	.49	1262.92	1	....
Aug. 30....	"	10	4	.66	1263.17	2	....
Sept. 20....	"	10	4	.69	1263.17	3	....
Oct. 28....	"	17	6	1.05	1297.25	6	....
Nov. 25....	"	49	20	2.27	1297.66	46	....
Dec. 18....	"	17	3	3.76	1297.29	12	....
1914							
Feb. 2 (a)	"	40	40	1.83	1299.29	73	....
Mar. 2....	"	15	5	.87	1297.25	4	....
" 24....	"	25	35	2.21	1297.79	78	....
April 7....	"	52	28	1.87	1297.79	53	....
" 20....	"	55	42	3.19	1297.95	136	....
June 11....	"	25	5	.35	1297.00	1	....
July 8....	"	36	3	.28	1296.96	1	....
" 9....	"	36	4	.25	1296.96	1	....
" 9....	"	36	4	.27	1296.96	1	....
Aug. 4....	"	35	3	.28	1296.92	1	....
" 4....	"	35	3	.30	1296.92	1	....
" 4....	"	35	3	.27	1296.92	1	....
" 5....	"	35	3	.28	1296.92	1	....
Sept. 1....	"	40	6	.56	1297.08	3	....
" 1....	"	40	6	.55	1297.08	3	....
" 1....	"	40	7	.53	1297.08	3	....
" 16....	"	41	5	.30	1297.00	1	....
" 16....	"	41	5	.30	1297.00	1	....
Oct. 6....	"	41	5	.28	1297.00	1	....
" 6....	"	41	5	.28	1297.00	1	....
Nov. 25....	"	47	24	.54	1297.33	13	....
" 25....	"	47	24	.52	1297.33	12	....
Dec. 28....	"	46	18	.51	1297.33	9	....

(a) Ice conditions

Daily Gauge Height and Discharge of Irvine River near Salem for 1913

Drainage Area, 64 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec ft.	Feet	Sec-ft.
1															1262.84	1	1262.97	2	1262.92	1	1297.19	3	1297.46	23
2															1262.88	1	1262.97	2	1262.92	1	1297.17	3	1297.46	25
3															1262.88	1	1262.97	2	1262.92	1	1297.17	3	1297.46	23
4															1262.90	1	1262.97	2	1262.92	1	1297.19	3	1297.43	20
5															1262.90	1	1262.97	2	1262.92	1	1297.19	3	1297.42	19
6															1262.90	1	1262.92	1	1262.92	1	1297.18	3	1297.39	16
7															1262.90	1	1262.92	1	1262.92	1	1297.17	3	1297.42	19
8															Gauge affected by backwater, elev. varied but little.		1262.92	1	1262.92	1	1297.26	6	1297.50	27
9																	1262.90	1	1262.92	1	1297.35	13	1297.42	19
10																	1262.88	1	1262.92	1	1297.48	25	1297.33	11
11																	1262.88	1	1262.92	1	1297.31	10	1297.33	11
12																	1262.88	1	1263.05	2	1297.31	10	1297.33	11
13																	1262.88	1	Gauge affected by backwater. Now cancelled.		1297.33	11	1297.33	11
14																	1262.88	1			1297.26	6	1297.33	11
15																	1262.88	1			1297.33	11	1297.33	11
16																	1262.88	1			1297.33	11	1297.33	11
17															1262.97	1	1262.88	1			1297.27	7	1297.33	11
18																	1262.90	1			1297.25	6	1297.29	8
19															1262.92	1	1262.97	2			1297.62	41	1297.29	8
20															1262.92	1	1263.17 1262.97	3			1297.92	94	1297.27	7
21															1262.92	1	1262.97	2			1297.88	86	1297.25	6
22															1262.94	1	1262.97	2			1297.75	62	1297.25	6
23															1263.03	2	1263.05	2	See second gauge for this stream where conditions are normal		1297.87	84	1297.25	6
24															1263.01	2	1263.05	2			1297.87	84	1297.23	5
25																	1263.01	2			1297.70	53	1297.23	5
26															1263.17 1262.99	3	1262.99	2			1297.60	39	1297.19	3
27															1262.97	2	1262.97	2		El. 1263.35 Dis. 6.93	1297.58	36	1297.25	6
28															1262.97	2	1262.97	2			1297.50	27	1297.23	5
29															1262.97	2	1262.92	1			1297.48	25	1297.21	4
30													1262.92	1	1263.01	2	1262.92	1			1297.45	22	1297.20	3
31													1262.88	1	1263.01	2	1262.92	1					1297.21	4

Daily Gauge Height and Discharge of Irvine River near Salem for 1914.

Drainage Area, 64 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	1297.21	4	1298.66	67	1297.25	6	1298.78	378	1297.66	47	1297.06	1	1297.06	1	1296.88	1	1297.25	6	1297.00	1	1297.17	1	1298.33	12
2	1297.21	4	1298.96	72	1297.25	6	1299.41	650	1297.54	32	1297.02	1	1297.04	1	1296.94	1	1297.33	12	1297.00	1	1297.17	1	1297.96	103
3	1297.24	5	1298,83	120	1297.08	1	1298.20	161	1297.48	25	1297.00	1	1297.01	1	1296.93	1	1297.29	9	1297.00	1	1297.16	1	1297.79	68
4	1297.25	6	1298.75	161	1297.08	1	1298.06	125	1297.42	19	1297.04	1	1297.00	1	1296.92	1	1297.16	2	1297.00	1	1297.16	1	1297.75	61
5	1297.29	9	1298.66	156	1297.08	1	1297.45	100	1297.42	19	1297.01	1	1297.00	1	1296.90	1	1297.13	2	1297.00	1	1297.16	1	1297.42	19
6	1297.33	12	1299.42	120	1297.00	0	1297.83	76	1297.42	19	1297.00	1	1297.00	1	1296.88	1	1297.20	2	1297.00	1	1297.16	1	1297.42	19
7	1297.33	12	1299.20	96	1297.00	0	1297.79	68	1297.42	19	1297.00	1	1297.00	1	1296.87	1	1297.12	2	1297.00	1	1297.12	1	1297.42	19
8	1297.33	12	1299.50	89	1297.00	0	1297.79	68	1297.48	25	1297.14	1	1297.00	1	1296.85	1	1297.11	2	1297.00	1	1297.12	1	1297.35	13
9	1297.33	12	1299.16	78	1297.00	0	1297.66	47	1297.39	16	1297.08	1	1296.95	1	1296.84	1	1197.08	1	1297.00	1	1297.12	1	1207.33	12
10	1296.33	12	1299.00	56	1297.00	0	1297,75	62	1297.33	12	1297.02	1	1296.94	1	1296.90	1	1297.08	1	1297.18	2	1297.12	1	1297.33	12
11	1299.33	12	1298.66	41	1297.00	0	1297.42	19	1297.31	10	1297.00	1	1296.93	1	1296.92	1	1297.08	1	1297.25	6	1297.12	1	1297.25	6
12	1297.33	12	1298.33	21	1297.00	0	1297.33	12	1297.29	9	1297.00	1	1296.92	1	1296.92	1	1297.08	1	1297.23	5	1297.15	1	1297.29	9
13	1297.42	19	1297.96	12	1297.04	1	1297.50	27	1297.33	12	1297.00	1	1296.93	1	1296.93	1	1297.08	1	1297.18	2	1297.33	12	1297.26	6
14	1297.44	21	1297.81	2	1297.25	2	1297.42	19	1297.31	10	1297.00	1	1296.96	1	1296.94	1	1297.00	1	1297.12	2	1297.39	17	1297.20	2
15	1297.44	21	1297.66	2	1297.50	28	1297.50	27	1297.25	6	1297.00	1	1296.96	1	1296.93	1	1297.00	1	1297.08	1	1297.46	23	1297.20	2
16	1297.44	21	1297.58	2	1300.04	900	1297.50	27	1297.25	6	1297.00	1	1296.94	1	1296.97	1	1297.00	1	1297.12	1	1297.66	47	1297.20	2
17	1297.42	19	1297.56	5	1299.42	650	1297.58	36	1297.16	2	1297.00	1	1296.94	1	1296.99	1	1297.00	1	1297.16	2	1297.66	47	1297.18	1
18	1297.42	19	1297.50	7	1298.83	400	1297.58	36	1297.16	2	1297.00	1	1296.93	1	1297.00	1	1296.98	1	1297.12	2	1297.75	61	1297.23	4
19	1297.46	23	1297.42	7	1298.54	280	1297.75	62	1297.16	2	1297.00	1	1296.92	1	1297.00	1	1296.98	1	1297.12	2	1297.42	19	1297.29	8
20	1297 50	27	1297.33	7	1298.42	240	1298.12	140	1297.16	2	1297.00	1	1296.90	1	1297.16	1	1296.96	1	1297.08	1	1297.42	19	1297.29	8
21	1297.50	27	1297.33	6	1298.42	240	1297.79	69	1297.14	2	1297.01	1	1296.89	1	1287.25	1	1296.96	1	1297.08	1	1297.33	12	1297.29	8
22	1297.52	29	1297.29	5	1298.08	130	1297.75	61	1297.12	2	1297.08	1	1296.86	1	1297.18	1	1297.00	1	1297.08	1	1297.33	12	1297.29	8
23	1297.52	29	1297.25	4	1297.83	76	1297.64	44	1297.16	2	1297.08	1	1296.86	1	1297.10	1	1297.02	1	1297.08	1	1297.31	10	1297.33	11
24	1297.68	34	1297.25	4	1297.77	66	1297.58	36	1297.12	2	1297.14	2	1296.92	1	1297.06	1	1296.96	1	1297.08	1	1297.29	9	1297.37	11
25	1297.92	41	1297.25	4	1297.92	94	1297.54	32	1297.16	2	1297.10	2	1296.93	1	1297.01	1	1296.96	1	1297.08	1	1297 29	9	1297.33	10
26	1297.83	47	1297.25	4	1299.04	490	1297.75	62	1297.14	2	1297.08	1	1296.91	1	1297.00	1	1296.96	1	1297.08	1	1297.29	9	1297.33	10
27	1297.81	41	1297.25	4	1299.12	520	1297.64	44	1297.12	2	1297.06	1	1296.90	1	1296.95	1	1296.96	1	1297.08	1	1293.75	61	1297.33	10
28	1297.93	41	1297.25	4	1298 99	465	1297.62	41	1297.10	2	1297.07	1	1296.92	1	1296.96	1	1296.96	1	1297.08	1	1297.75	61	1297.33	10
29	1298.25	53	....	....	1298.70	345	1297.68	50	1297.08	1	1297.08	1	1296.91	1	1297.04	1	1296.98	1	1297.10	1	1297.58	36	1297.25	6
30	1298.92	65	....	....	1299.75	795	1297.79	69	1297.12	2	1297.07	1	1296.89	1	1297.08	1	1297.00	1	1297.15	2	1297.68	36	1247.25	6
31	1298.50	63	....	....	1298 62	311	....	....	1297.08	1	....	....	1296.88	1	1297 06	1	....	....	1297.16	2	....	....	1297.25	6

Monthly Discharge of Irvine River near Salem for 1913

Drainage Area, 64 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	....	....	....	....	....	....	....
November	94	3	26	1.47	.05	0.41	.46
December	27	3	12	.42	.05	.18	.21
The period	94	3	19	1.42	.05	.29	.67

Monthly Discharge of Irvine River near Salem for 1914

Drainage Area, 64 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	65	4	24	1.02	.06	.38	.44
February	161	2	41	2.52	.03	.65	.67
March	900	0	195	14.06	.00	3.05	3.52
April	650	12	88	10.15	.19	1.38	1.54
May	47	1	10	.73	.02	.16	.18
June	2	1	1	.03	.02	.02	.02
July	1	1	1	.02	.02	.02	.02
August	1	1	1	.02	.02	.02	.03
September	12	1	2	.19	.02	.03	.03
October	6	1	1	.09	.02	.02	.02
November	61	1	17	.95	.02	.27	.30
December	103	1	15	1.61	.02	.24	.28
The year	900	0	33	14.06	0.00	.52	7.04

Conestogo River at St. Jacob's

Location—At the bridge in the Village of St. Jacob's, Township of Woolwich. County of Waterloo.

Records Available—July 16th, 1913, to Dec. 31st, 1914.

Drainage Area—312 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on right abutment. Elev. of zero on gauge is 1057.00, which has remained unchanged since established.

Channel—Loose gravel forms the bed of stream, and under high water conditions is shifting. The banks may be classed as fairly permanent.

Discharge Measurements—Made from the bridge, and a permanent low-water cross-section is located 800 feet down stream for the low-water period.

Control—The power plant used at night up to 11 p.m. and the same plant used for milling purposes during the day cause large fluctuations in the river stage at this section.

Accuracy—These records cannot be classed as better than fair.

Observer—Amy Niebergall.

Discharge Measurements of Conestogo River at St. Jacob's in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 16....	Roberts, E	56	31	1.17	1058.32	36	....
Aug. 27....	"	51	20	.55	1058.01	11	....
Sept. 23....	"	51	18	.44	1057.96	8	....
Oct. 29....	"	50	33	1.49	1058.45	50	....
Nov. 27....	"	130	171	1.25	1058.95	214	....
Dec. 18....	"	118	131	.80	1058.64	105	....
1914	"						
Feb. 5....	"	140	330	1.04	1059.42	344	....
March 5 (a)	"	79	47	1.00	1058.75	47	....
" 26....	"	170	937	2.30	1060.75	21	....
April 8....	"	145	246	1.00	1058.95	247	....
" 23....	"	115	216	1.21	1059.00	260	....
June 12....	"	107	121	.24	1058.08	29	....
July 10....	"	22	7	.62	1057.64	4	....
Aug. 5....	"	27	10	.65	1057.71	6	....
Sept. 1....	"	30	13	.47	1057.71	6	....
" 6....	"	30	13	.45	1057.71	5	....
" 1....	"	30	13	.45	1057.71	5	....
" 11....	"	52	22	.93	1058.08	21	....
" 16....	"	52	22	1.00	1058.08	22	....
Oct. 6....	"	21	6	.35	1057.60	2	....
" 6....	"	21	6	.35	1057.60	2	....
Nov. 26....	"	105	108	.63	1058.40	68	....
Dec. 30....	"	37	27	1.04	1058.25	28	....

(a) Ice conditions

Daily Gauge Height and Discharge of Conestogo River at St. Jacob's for 1913

Drainage Area, 312 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1058.00	9	1058.00	9	1058.88	182	1059.80	820
2	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.04	12	1058.00	9	1058.83	161	1059.77	790
3	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1058.04	12	1058.00	9	1058.96	219	1059.68	700
4	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1058.04	12	1058.04	12	1058.87	177	1059.68	700
5	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1057.95	8	1057.95	7	1058.96	219	1059.64	670
6	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1057.95	8	1057.93	6	1058.88	182	1059.62	660
7	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1057.91	6	1057.95	7	1058.88	182	1059.58	630
8	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1057.91	6	1057.95	7	1058.83	161	1059.50	560
9	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.08	15	1057.95	7	1057.95	7	1058.71	122	1059.12	320
10	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.12	18	1057.95	7	1057.95	7	1958.83	161	1058.94	209
11	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.08	15	1057.95	7	1057.97	8	1058.64	103	1058.83	161
12	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.08	15	1057.95	7	1057.94	6	1058.54	80	1058.83	161
13	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1057.91	6	1058.04	12	1058.50	71	1058.75	134
14	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1057.91	6	1057.97	8	1058.52	74	1058.67	110
15	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1057.91	6	1058.08	15	1058.62	98	1058.75	134
16	......	......	......	......	......	......	......	......	......	......	......	......	1058.32	37	1058.00	9	1057.91	6	1058.06	14	1058.67	104	1058.79	134
17	......	......	......	......	......	......	......	......	......	......	......	......	1058.24	30	1058.00	9	1058.00	9	1057.97	8	1058.62	98	1058.71	122
18	......	......	......	......	......	......	......	......	......	......	......	......	1058.16	21	1058.00	9	1057.95	7	1057.95	7	1058.56	84	1058.60	93
19	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1058.00	9	1057.95	7	1057.95	7	1060.29	1400	1058.71	122
20	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1058.00	9	1057.95	7	1058.12	18	1059.71	740	1058.69	116
21	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1057.95	7	1058.00	9	1058.16	21	1059.62	660	1058.71	122
22	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1057.97	8	1058.00	9	1058.04	12	1059.54	600	1058.58	88
23	......	......	......	......	......	......	......	......	......	......	......	......	1058.04	12	1058.00	9	1057.96	8	1058.08	15	1059.62	660	1058.54	80
24	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.00	9	1057.93	6	1058.16	21	1059.39	480	1058.46	64
25	......	......	......	......	......	......	......	......	......	......	......	......	1058.00	9	1058.00	9	1057.95	7	1058.10	17	1059.44	510	1058.35	46
26	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.04	12	1057.95	7	1058.12	18	1059.04	263	1058.42	57
27	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1058.01	10	1058.04	12	1058.33	40	1059.50	560	1058.37	49
28	......	......	......	......	......	......	......	......	......	......	......	......	1057.91	6	1058.04	12	1058.05	13	1058.25	30	1059.92	950	1058.35	46
29	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.00	9	1058.04	12	1058.46	63	1059.75	770	1058.42	57
30	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.00	9	1058.00	9	1058.62	99	1059.79	800	1058.46	64
31	......	......	......	......	......	......	......	......	......	......	......	......	1057.95	7	1058.00	9	......	......	1058.81	158	......	......	1058.39	52

Daily Gauge Height and Discharge of Conestogo River at St. Jacob's for 1914

Drainage Area, 312 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1058.25	33	1061.92	770	1058.77	37	1060.42	1600	1058.89	186	1057.83	7	1057.60	4	1057.62	4	1057.87	8	1057.71	4	1057.77	4	1059.42	500
2	1058.29	38	1059.96	560	1058.77	39	1062.16	4800	1058.77	140	1057.71	4	1057.60	4	1057.66	4	1057.94	11	1057.73	4	1057.87	7	1059.37	475
3	1058.29	38	1059.83	430	1058.79	43	1060.29	1380	1058.60	93	1057.68	4	1057.60	4	1057.60	4	1057.73	4	1057.73	4	1057.92	10	1059.35	460
4	1058.27	35	1059.56	350	1058.75	44	1059.71	730	1058.50	71	1057.79	6	1057.60	4	1057.56	4	1058.16	24	1057.73	4	1058.02	15	1059.08	300
5	1058.25	33	1059.44	345	1058.75	48	1059.42	500	1058.50	71	1057.75	5	1057.60	4	1057.58	4	1057.79	4	1057.71	4	1057.83	7	1058.66	108
6	1058.29	38	1059.50	260	1058.71	50	1059.06	276	1058.42	57	1057.77	5	1057.62	4	1057.58	4	1057.98	12	1057.79	6	1057.87	7	1058.68	113
7	1058.37	49	1059.48	194	1058.71	50	1058.83	161	1058.46	64	1057.81	6	1057.70	4	1057.60	4	1058.02	15	1057.81	6	1057.87	7	1058.52	75
8	1058.25	33	1059.50	150	1058.62	43	1058.87	177	1058.42	57	1057.87	8	1057.58	4	1057.58	4	1057.92	10	1057.83	7	1057.89	8	1058.62	98
9	1058.33	43	1059.46	120	1058.71	39	1058.94	209	1058.42	57	1057.66	4	1057.54	4	1057.60	4	1057.79	4	1057.79	6	1057.85	7	1058.71	122
10	1058.29	38	1059.37	75	1058.71	39	1058.62	98	1058.25	33	1057.64	4	1057.58	4	1057.64	4	1057.78	4	1057.81	6	1057.87	7	1058.50	72
11	1058.27	35	1059.37	56	1058.62	39	1058.77	140	1058.27	35	1057.68	4	1057.58	4	1057.66	4	1057.79	4	1057.85	7	1057.98	12	1058.39	52
12	1058.20	28	1059.25	44	1058.62	39	1058.73	128	1058.25	33	1057.71	4	1057.60	4	1057.58	4	1057.81	6	1057.96	12	1058.10	19	1058.31	40
13	1058.12	21	1059.16	32	1058.71	42	1058.62	98	1058.27	35	1057.60	4	1057.64	4	1057.58	4	1057.75	5	1058.16	24	1058.12	21	1058.08	18
14	1058.29	38	1059.04	23	1058.71	120	1058.60	93	1058.25	33	1057.60	4	1057.75	5	1057.60	4	1057.73	4	1057.89	8	1058.18	25	1058.18	26
15	1058.33	43	1058.94	19	1059.58	550	1058.62	98	1058.20	28	1057.60	4	1057.71	4	1057.62	4	1057.71	4	1057.87	7	1058.27	35	1058.20	28
16	1058.39	52	1058.83	13	1060.71	2050	1058.71	122	1058.25	33	1057.58	4	1057.68	4	1057.64	4	1057.68	4	1057.85	7	1058.85	169	1058.00	13
17	1058.37	49	1058.37	11	1061.71	3940	1058.71	122	1058.12	20	1057.64	4	1057.71	4	1057.64	4	1057.71	4	1057.85	8	1058.87	176	1057.85	7
18	1058.44	60	1058.71	16	1061.50	3530	1058.68	113	1058.12	20	1057.64	4	1057.68	4	1057.67	4	1057.71	4	1057.89	4	1058.81	154	1058.10	18
19	1058.56	84	1058.79	22	1060.54	1770	1058.75	134	1058.08	18	1057.68	4	1057.60	4	1057.69	4	1057.68	4	1057.77	7	1058.73	128	1057.92	9
20	1058.54	80	1058.83	29	1060.20	1270	1059.08	290	1058.00	13	1057.62	4	1057.62	4	1057.77	5	1057.66	4	1057.83	4	1058.68	113	1057.56	4
21	1058.50	71	1058.79	33	1059.54	680	1059.16	350	1057.98	12	1057.58	4	1057.62	4	1058.08	18	1057.68	4	1057.77	7	1058.77	140	1057.92	8
22	1058.46	64	1058.77	39	1059.56	650	1059.00	240	1057.92	10	1057.81	6	1057.60	4	1058.12	21	1057.66	4	1057.85	11	1058.52	75	1058.02	11
23	1058.48	67	1058.75	39	1059.35	460	1058.87	177	1057.92	10	1057.60	4	1057.58	4	1057.96	12	1057.92	10	1057.94	7	1058.35	46	1058.23	24
24	1058.48	67	1058.85	39	1059.08	290	1058.71	122	1057.89	8	1057.66	4	1057.60	4	1057.92	10	1057.96	12	1057.83	4	1058.37	49	1058.20	20
25	1058.66	108	1058.75	39	1059.25	400	1058.71	122	1057.85	7	1057.68	4	1057.60	4	1057.92	10	1057.96	12	1057.77	4	1058.20	28	1058.27	26
26	1058.89	186	1058.79	39	1061.16	2900	1058.71	122	1057.77	5	1057.62	4	1057.60	4	1057.71	4	1057.87	8	1057.77	4	1058.60	93	1058.23	21
27	1058.77	140	1058.79	37	1063.46	7400	1058.71	122	1057.83	7	1057.68	4	1057.66	4	1057.77	5	1057.83	7	1057.71	4	1058.96	219	1058.16	15
28	1059.06	170	1058.80	37	1062.33	5150	1058.16	108	1057.79	6	1057.62	4	1057.66	4	1057.75	5	1057.92	10	1057.77	4	1059.27	400	1058.23	18
29	1059.71	250	....	....	1061.66	3850	1058.71	122	1057.79	6	1057.85	7	1057.68	4	1058.00	13	1057.81	6	1057.77	4	1059.00	240	1058.50	44
30	1063.75	1700	....	....	1062.79	6050	1058.68	113	1058.04	15	1057.62	4	1057.64	4	1057.73	4	1057.75	5	1057.87	7	1059.04	263	1058.37	28
31	1063.66	1700	....	....	1062.54	4600	....	....	1057.87	8	....	....	1057.66	4	1057.66	4	....	....	1057.73	4	....	....	1058.35	23

Monthly Discharge of Conestogo River at St. Jacob's for 1913

Drainage Area 312 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	18	6	9	.06	.02	.03	.03
September	13	6	8	.04	.02	.03	.03
October	158	6	22	.50	.02	.07	.08
November	1,400	71	362	4.49	.23	1.16	1.29
December	820	46	260	2.63	.15	.83	.95
The period	1,400	6	132	4.49	.02	.42	2.38

Monthly Discharge of Conestogo River at St. Jacob's for 1914

Drainage Area 312 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	1,700	21	174	5.45	.07	.56	.64
February	770	11	137	2.47	.04	.44	.46
March	7,400	37	1,491	23.72	.12	4.78	5.51
April	4,800	93	429	15.38	.30	1.37	1.53
May	186	5	38	.60	.02	.12	.14
June	8	4	4	.03	.01	.01	.01
July	5	4	4	.02	.01	.01	.01
August	21	4	6	.07	.01	.02	.02
September	24	4	7	.08	.01	.02	.02
October	24	4	6	.08	.01	.02	.02
November	400	4	82	1.28	.01	.27	.30
December	500	4	89	1.60	.01	.29	.33
The year	7,400	4	207	23.72	.01	.66	8.99

Speed River at Caraher's Bridge

Location.—At the bridge named Caraher's above the junction of the Speed and Eramosa Rivers, 3¾ miles from the City of Guelph.

Records Available.—Oct. 27th, 1913, to Dec. 31st, 1914.

Drainage Area.—80.5 square miles.

Gauge.—Vertical staff, 0 ft.—12 ft. on right abutment. Elev. of zero on gauge is 1126.00, which has remained unchanged since established.

Channel.—Somewhat shifting from year to year.

Discharge Measurements.—From the bridge and from a permanent low-water cross-section located 300 feet down stream.

Winter Flow.—From December to March this section is affected by ice and the open channel curve is not applicable. Winter readings, however, are taken to determine this charge.

Control.—At this section the river stage is not seriously affected by a dam located upstream.

Accuracy.—Conditions at this station are favorable for good results, although the shifting of the river bed during high water may necessitate the use of more than one curve.

Observer.—Hugh Caraher.

Discharge Measurements of Speed River at Caraher's Bridge near Guelph, in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 28....	Roberts, E	28	12	.73	1127.93	9	....
Aug. 21....	"	28	12	.50	1127.75	6	....
Sept. 19....	"	35	15	.86	1127.97	13	....
Oct. 27....	"	50	35	.70	1128.08	24	....
Nov. 24....	"	69	102	.92	1128.58	93	....
Dec. 17....	"	50	27	.47	1127.94	13	....
1914							
Jan. 31 (a)	"	58	96	1.46	1129.25	140	....
Mar. 1 (a)	"	60	20	.46	1128.76	9	....
" 24 (a)	"	61	63	1.27	1129.26	80	....
" 29....	"	70	193	2.42	1129.66	466	....
April 7....	"	62	62	1.36	1128.56	85	....
" 21....	"	60	81	1.46	1128.66	119	....
June 10....	"	51	23	.26	1127.87	5	....
July 7....	"	44	15	.21	1127.81	3	....
" 7....	"	44	15	.23	1127.81	3	....
Aug. 5....	"	37	9	.14	1127.75	1	....
Sept. 2....	"	59	80	2.00	1128.92	161	....
" 2....	"	59	81	1.98	1128.92	161	....
" 17....	"	45	20	.34	1127.92	6	....
" 17....	"	45	16	.22	1127.84	3	....
" 17....	"	46	17	.26	1127.86	4	....
Oct. 5....	"	45	22	.37	1127.93	8	....
" 5....	"	45	20	.37	1127.90	7	....
" 5....	"	45	20	.37	1227.87	7	....
" 5....	"	45	19	.33	1127.84	6	....
Nov. 23....	"	57	48	.80	1128.35	38	....
" 23....	"	57	48	.80	1228.35	38	....
" 27....	"	59	76	1.67	1128.75	127	....
" 27....	"	59	80	1.84	1128.83	148	....
Dec. 31 (a)	"	60	38	.72	1129.00	27	....

(a) Ice conditions

Daily Gauge Height and Discharge of Speed River, at Caraher's Bridge near Guelph for 1913

Drainage Area. 80.5 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1																					1128.04	20	1128.16	31
2																					1128.08	23	1128.12	27
3																					1127.75	2	1128.08	23
4																					1127.75	2	1128.08	23
5																					1127.92	10	1128.08	23
6																					1128.04	20	1128.16	31
7																					1128.00	16	1128.04	20
8																					1127.92	10	1128.08	23
9																					1128.08	23	1128.12	27
10																					1128.46	73	1128.21	37
11																					1128.46	73	1128.12	27
12																					1128.21	37	1128.12	27
13																					1128.12	27	1128.00	16
14																					1128.17	33	1128.08	23
15																					1128.25	42	1128.00	16
16																					1128.08	23	1128.04	20
17																					1128.12	27	1128.04	20
18																					1128.12	27	1128.17	33
19																					1128.58	98	1127.92	10
20																					1128.87	180	1127.87	7
21																					1128.67	121	1127.87	7
22																					1128.50	80	1128.12	27
23																					1128.83	168	1128.12	27
24																					1128.62	109	1128.00	16
25																					1128.37	58	1127.96	13
26																					1128.33	53	1128.20	36
27																					1128.33	53	1128.33	53
28																					1128.33	53	1127.83	5
29																					1128.29	47	1128.25	42
30																					1128.25	42	1128.25	42
31																							1127.96	13

Daily gauge height and discharge of Speed River at Caraher's Bridge near Guelph for 1914

Drainage Area, 80.5 Square Miles.

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1128.20	36	1129.50	109	1128.76	9	1128.66	115	1128.33	53	1127.71	4
2	1128.20	36	1129.16	81	1128.68	11	1130.16	685	1128.23	40	1127.60	2
3	1128.00	16	1129.16	60	1128.77	14	1129.42	370	1128.27	44	1127.60	2
4	1128.00	16	1128.96	56	1128.68	14	1128.96	219	1128.20	36	1127.58	2
5	1128.00	16	1129.00	53	1128.75	11	1128.50	80	1128.20	36	1127.62	2
6	1128.20	36	1129.00	45	1128.62	11	1128.33	53	1128.20	36	1127.60	2
7	1128.33	63	1129.00	43	1128.58	13	1128,66	119	1128.18	34	1127.64	2
8	1128.33	63	1129.00	36	1128.54	19	1128.46	73	1128.12	27	1127.60	2
9	1128.33	63	1129.00	31	1128.50	18	1128.31	50	1128.08	23	1127.66	2
10	1128.25	42	1128.87	27	1128.71	16	1128.20	36	1128.02	18	1127.64	2
11	1128,00	16	1128.83	26	1128.87	10	1128.23	40	1128 10	25	1127.64	3
12	1128.16	31	1128.75	23	1128.96	12	1128.20	36	1128.12	27	1127.64	3
13	1128.42	66	1128.71	20	1128.71	14	1128.23	40	1128.14	29	1127.71	2
14	1128.42	66	1128.62	16	1129.00	30	1128.20	36	1128.12	27	1127.62	2
15	1128.29	47	1128.58	14	1129.16	60	1127.96	13	1128.02	18	1127.64	2
16	1128.16	33	1128.62	12	1129.92	108	1127.96	13	1128.08	23	1127.64	2
17	1128.25	42	1128.62	8	1131.25	348	1128.33	53	1128.00	16	1127.64	2
18	1128.25	42	1128.50	7	1131.20	505	1128.37	58	1127.96	13	1127.60	2
19	1128.42	66	1128.29	5	1130.46	445	1128.37	58	1127.89	8	1127.64	2
20	1128.62	108	1128.25	5	1130.20	328	1128.46	73	1127.85	6	1127.68	2
21	1128.46	73	1128.16	4	1129.79	268	1128.29	47	1127.87	7	1127.64	2
22	1128.66	120	1128.20	4	1129.66	189	1128.25	42	1127.83	6	1127.68	2
23	1128.66	120	1128.16	4	1129.54	84	1128.29	47	1127 89	8	1127.62	2
24	1128.66	120	1128.08	4	1129.29	81	1128.37	58	1127.87	7	1127.71	2
25	1128.67	121	1128.12	4	1129.31	330	1128.37	58	1127.89	8	1127.77	2
26	1128.67	121	1128.25	4	1130.25	725	1128.37	58	1127.89	8	1127.68	2
27	1128.58	98	1128.29	4	1131.87	1590	1128.25	42	1127.92	10	1127.66	2
28	1128.62	108	1128.58	6	1131.21	1200	1128.20	36	1127.85	6	1127.66	2
29	1128.79	120	....	....	1129.75	505	1128.42	66	1127.81	5	1127.66	2
30	1129.58	132	....	....	1130.12	665	1128.52	85	1127.83	6	1127.66	2
31	1129.25	141	....	....	1129.89	565	....	....	1127.77	5	....	....

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1127.70	2	1127.66	2	1128.08	23	1127.75	2	1128.08	23	1128.46	74
2	1127.70	2	1127.70	2	1128.92	194	1127.71	2	1128.12	27	1128.50	80
3	1127.75	2	1127.67	2	1128.54	89	1127.68	2	1128.16	31	1128.52	84
4	1127.75	2	1127.66	2	1128.60	103	1127.68	2	1128.14	29	1128.46	74
5	1127.75	2	1127.66	2	1128.04	19	1127.68	2	1128.08	23	1128.42	66
6	1127.83	4	1127.62	2	1128.16	31	1127.66	2	1128.04	19	1128.20	36
7	1127.83	4	1127.64	2	1128.46	74	1127.71	2	1128.00	16	1127.96	13
8	1127.92	10	1127.64	2	1128.18	33	1127.68	2	1128.00	16	1127.94	11
9	1127.89	8	1127.66	2	1128.06	21	1127.66	2	1128.00	16	1127.92	10
10	1127.83	4	1127.68	2	1128.02	18	1127.75	2	1127.92	10	1127.96	11
11	1127.75	2	1127.73	2	1127.92	10	1127.75	2	1127.92	10	1128.04	12
12	1127.66	2	1127.75	2	1127.89	8	1127.83	5	1128.04	19	1128.12	13
13	1127.75	2	1127.73	2	1127.83	5	1127.92	10	1128.16	31	1128.12	13
14	1127.73	2	1127.79	3	1127.85	6	1128.00	16	1128.08	23	1128.04	12
15	1127.73	2	1127.87	7	1127.92	10	1128.00	16	1128 37	58	1128.37	17
16	1127.75	2	1127.92	10	1127.92	10	1128.12	27	1128.96	208	1128.66	22
17	1127.77	2	1127.77	3	1127.75	2	1128.20	36	1128.87	180	1128.25	16
18	1127.71	2	1127.79	3	1127.75	2	1128.12	27	1128.66	120	1128.62	21
19	1127.75	2	1127.98	14	1127.73	2	1128.04	19	1228.54	89	1128.58	20
20	1127.72	2	1128.04	19	1127.75	2	1128.00	16	1128.44	70	1128.37	17
21	1127.68	2	1128.25	42	1127.73	2	1127.94	11	1128.33	53	1128.54	20
22	1127.70	2	1128.04	19	1127.83	5	1127.92	10	1128.37	58	1128.52	19
23	1127.68	2	1127.92	10	1127.98	14	1127.92	10	1128.46	74	1128.68	22
24	1127.75	2	1127.88	8	1127.92	10	1127.89	8	1128.42	66	1128.50	19
25	1127.73	2	1127.85	6	1127.85	6	1127.83	5	1128 39	61	6128.48	19
26	1127.68	2	1127.94	11	1127.81	4	1127.83	5	1128.37	58	1128.50	19
27	1127.68	2	1127.94	11	1127.81	4	1127.81	4	1128.37	58	1128.62	21
28	1127.75	2	1127.90	8	1127.75	2	1127.83	5	1128.37	58	1128.75	23
29	1127.70	2	1127.90	8	1127.73	2	1128.00	16	1128.37	58	1128.77	24
30	1127.68	2	1127.94	11	1127.71	2	1128.14	29	1128.42	66	1128.75	23
31	1127.66	2	1127.87	7	....	.....	1128.12	27	....	....	1128.75	23

Monthly Discharge of Speed River at Caraher's Bridge near Guelph for 1913

Drainage Area, 80.5 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	....	....	....	....	....	....	....
November	180	2	51.7	2.24	.02	.64	.71
December	53	5	24.4	.66	.06	.30	.35
The period	180	2	37.6	2.24	.02	.47	1.06

Monthly Discharge of Speed River at Caraher's Bridge near Guelph for 1914

Drainage Area, 80.5 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	141	16	70	1.75	.20	.87	1.00
February	109	4	25	1.35	.05	.31	.32
March	1590	9	26	19.75	.11	3.28	3.48
April	685	13	92	8.51	.16	1.14	1.27
May	53	5	19	.66	.06	.25	.29
June	4	2	2	.05	.02	.03	.03
July	10	2	2	.12	.02	.03	.03
August	42	2	7	.52	.02	.09	.10
September	194	2	23	2.41	.02	.30	.33
October	36	2	10	.45	.02	.13	.15
November	208	10	54	2.58	.12	.67	.74
December	84	10	27	1.04	.12	.34	.39
The year	1590	2	50	19.75	.02	.62	8.13

Speed River at Hespeler

Location—At a point 100 ft. below the gaol, which adjoins the power house, in the Town of Hespeler.

Records Available—July 10th, 1913, to Dec. 31st, 1914. (Daily gauge heights from Oct. 23rd, 1913, to Dec. 31st, 1914).

Drainage Area—259 sq. miles.

Gauge—Vertical staff, 0 ft.—12 ft. on gaol wall adjoining power house. The elevation of zero on gauge is 935.00, which has remained unchanged since established.

Channel—Loose gravel; shifting.

Discharge Measurements—Made from the permanent wading section, and the dam above will be used as a weir for flood discharge.

Winter Flow—This section is largely free from ice. The relation between gauge height and discharge is little affected.

Accuracy—Daily discharges were computed from a well-defined curve up to July 1st, 1914. Subsequent measurements showed a change in the section affecting flows up to 250 sec.-ft. For flows above this amount there was no appreciable change.

Observer—W. D. Scott.

Discharge Measurements of Speed River at Hespeler in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
July 10....	Roberts, E	95	73	1.45	936.10	107	....
Aug. 20....	"	80	50	1.12	935.86	56	....
Sept. 18....	"	84	57	1.37	936.01	78	....
Oct. 25....	"	85	83	1.85	936.41	152	....
Nov. 13....	"	85	87	1.89	936.49	164	....
Dec. 16....	"	85	64	1.61	936.26	102	....
1914							
Jan. 28....	"	90	81	2.23	936.50	180	....
Feb. 21....	"	85	66	1.22	936.00	80	....
Mar. 23....	"	89	112	3.09	936.83	346	....
April 6....	"	90	132	2.65	937.08	349	....
" 23....	"	87	119	2.50	936.92	299	....
June 9....	"	85	68	1.94	936.31	133	....
" 9....	"	85	63	1.83	936.29	115	....
July 2....	"	75	46	1.01	936.08	46	....
" 2....	"	75	46	1.06	936.08	48	....
" 2....	"	75	49	.95	936.08	47	....
" 7....	"	90	70	1.17	936.25	81	....
" 7....	"	90	70	1.24	936.26	87	....
Aug. 7....	"	91	74	1.32	936.31	98	....
" 25....	"	92	82	1.26	936.34	102	....
" 25....	"	92	81	1.28	936.33	103	....
" 26....	"	82	69	1.17	936.24	80	....
Sept. 7....	"	92	88	1.23	936.39	107	....
" 7....	"	92	89	1.20	936.40	107	....
" 18....	"	74	34	.91	935.97	30	....
" 18....	"	91	72	1.31	936.33	93	....
" 18....	"	91	71	1.22	936.32	86	....
Oct. 7....	"	91	71	1.07	936.26	75	....
" 7....	"	91	71	1.10	936.26	78	....
" 20....	"	92	80	1.19	936.26	95	....
" 20....	"	92	81	1.19	936.26	96	....
" 20....	"	92	79	1.21	936.26	96	....
" 20....	"	92	80	1.21	936.26	97	....
Nov. 17....	"	99	136	1.83	936.81	249	....
" 17....	"	99	134	1.88	936.81	252	....
Dec. 3....	"	98	129	1.86	936.75	240	....

Daily Gauge Height and Discharge of Speed River at Hespeler for 1913

Drainage Area, 259 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1																					936.21	113	936.37	106
2																					936.21	113	936.42	157
3																					936.21	113	936.33	135
4																					936.21	113	936.29	129
5																					936.25	120	936.25	120
6																					936.16	105	936.37	145
7																					936.14	100	936.37	145
8																					936.21	113	936.29	129
9																					936.37	145	936.23	117
10																					936.79	250	936.29	129
11																					936.70	225	936.29	129
12																					936.50	175	936.21	113
13																					936.43	158	936.21	113
14																					936.54	183	936.17	105
15																					936.54	183	936.25	120
16																					936.29	128	936.25	120
17																					936.33	135	936.21	113
18																					936.25	120	936.23	117
19																					936.56	188	936.21	113
20																					937.06	342	936.37	145
21																					937.18	392	936.10	93
22																					936.87	277	936.31	133
23																					937.00	323	936.27	125
24																					936.87	276	936.10	93
25																					936.42	157	936.17	105
26																					936.58	194	936.19	110
27																					936.59	196	936.21	113
28																					936.50	175	936.17	105
29																					936.42	157	936.23	118
30																					936.46	164	936.21	113
31																							936.19	110

Daily Gauge Height and Discharge of Speed River at Hespeler for 1914

Drainage Area, 259 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	936.08	90	937.08	350	936.23	118	938.20	873	936.93	297	936.23	117
2	936.10	93	936.92	295	936.54	185	938.33	935	936.81	255	936.20	113
3	938.08	90	936.83	265	936.44	160	938.25	895	936.75	238	936.27	125
4	936.08	90	936.83	265	936.35	140	937.79	665	936.75	238	936.31	133
5	936.25	120	936.79	250	936.33	135	937.42	495	936.66	215	936.27	125
6	936.29	128	936.71	228	936.35	140	937.16	380	936.68	220	936.14	100
7	936.27	125	936.68	220	936.33	135	937.04	335	936.66	215	936.18	108
8	936.31	133	936.64	210	936.25	120	937.00	320	936.60	198	936.31	133
9	936.33	135	936.58	195	936.27	125	936.75	238	936.50	173	936.37	145
10	936.25	120	936.56	188	936.29	128	936.73	235	936.50	173	936.33	135
11	936.08	90	936.52	180	936.25	120	936.73	235	936.44	160	936.08	90
12	936.27	125	936.50	173	936.42	155	936.68	220	936.52	178	936.16	105
13	936.33	135	936.50	173	936.25	120	936.66	215	936.56	188	936.16	105
14	936.31	133	936.42	155	936.31	133	936.68	220	936.52	178	936.14	100
15	936.31	133	936.42	155	937.10	358	936.71	228	936.42	155	936.23	116
16	936.33	135	936.50	173	937.14	375	936.71	228	936.27	125	936.16	105
17	936.29	128	936.50	173	937.64	595	936.71	228	936.25	120	936.14	100
18	936.20	110	936.54	185	938.23	885	936.71	228	936.29	128	936.08	90
19	936.25	120	936.58	195	937.58	570	936.68	220	936.25	120	936.08	90
20	936.33	135	936.58	195	937.27	425	937.02	328	936.31	133	935.92	65
21	936.27	125	936.56	188	937.16	380	937.04	336	936.29	128	935.98	75
22	936.27	125	936.56	188	937.16	380	937.06	343	936.37	145	935.96	70
23	936.33	135	936.58	195	936.79	250	936.92	295	936.33	135	936.02	80
24	936.29	128	936.58	195	936.71	228	936.87	275	936.27	125	936.02	80
25	936.20	110	936.62	203	936.75	238	936.81	255	936.20	113	936.14	100
26	936.33	135	936.66	215	937.08	350	936.75	238	936.29	128	936.06	85
27	936.44	160	936.33	138	938.08	810	936.87	275	936.31	133	936.08	90
28	936.58	193	936.35	140	939.31	1415	936.89	285	936.35	140	936.04	85
29	936.46	164	......	.....	939.04	1290	936.89	285	936.33	135	936.20	110
30	937.25	418	......	.....	938.42	980	936.83	265	936.27	125	936.18	105
31	937.25	418	......	.....	938.68	1119	......	.....	936.27	125	......	.....

Day	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	936.14	58	936.04	44	936.27	84	936.10	53	935.84	23	936.48	136
2	936.14	58	935.94	32	936.39	112	936.06	46	936.06	46	936.46	129
3	936.14	58	935.98	36	936.66	195	936.04	44	436.09	52	936.60	175
4	935.98	36	936.16	62	936.46	177	935.81	18	936.07	48	936.62	180
5	936.04	44	935.16	62	936.46	177	936,08	50	936.08	50	936.56	195
6	936.12	54	936.08	50	936.37	105	936.09	52	836.08	50	936.23	75
7	936.16	62	936.04	44	936.37	105	936.08	50	936.06	46	936.04	44
8	936.16	62	935.92	29	936.37	105	936.10	53	935.82	19	936.31	92
9	936.18	66	935.85	23	936.35	101	936.07	48	936.06	46	936.25	78
10	936.16	62	936.16	62	936.44	125	936.04	44	936.04	44	936.12	54
11	936.14	58	936.20	70	936.37	105	935.96	33	936.03	42	936.16	62
12	935.94	32	936.25	78	936.33	97	936.10	53	936.02	41	936.18	66
13	936.14	58	936.23	75	936.08	50	936.14	58	936.03	42	936.06	46
14	936.23	75	936.04	44	936.31	92	936.16	62	986.01	39	936.16	62
15	936.16	62	935.85	21	936.27	84	936.16	62	935.92	29	936.29	89
16	936.16	62	935.65	12	936.25	78	936.12	54	936.85	23	936.04	44
17	936.16	62	936.25	78	936.14	58	936.13	56	936.58	167	936.04	44
18	935.98	36	936.27	84	936.10	53	936.08	50	936.52	146	936.06	46
19	936.00	38	936.33	97	936.10	53	936.16	62	936.39	112	936.06	46
20	936.14	58	936.27	84	935.87	25	936.12	54	936.18	66	935.87	24
21	931.16	62	936.29	89	936.08	50	936.04	44	936.20	70	936.02	41
22	936.08	50	936.33	97	936.08	50	936.06	46	936.10	53	936.04	44
23	936.16	62	936.23	75	936.10	53	936.08	50	936.16	62	936.02	41
24	936.20	70	936.27	84	936.12	54	936.06	46	936.12	54	936.06	46
25	936.08	50	936.27	84	936.10	53	935.85	23	936.27	84	935.66	13
26	935.89	27	936.29	89	936.06	46	936.07	48	936.27	84	935.62	10
27	936.14	58	936.23	75	935.98	36	936.06	46	936.44	125	935.62	10
28	936.14	58	936.15	60	936.08	50	936.06	46	936.31	92	936.02	41
29	936.12	54	936.15	60	936.08	50	936.07	48	936.31	92	936.10	49
30	936.12	54	936.20	70	936.14	58	936.05	46	936 33	97	936.23	73
31	936.16	62	936.25	78	....	.....	935.85	23	......	.....	936.25	74

Monthly Discharge of Speed River at Hespeler for 1913

Drainage Area, 259 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Miles			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	....	....	....	....	....	....	....
November	392	100	181	1.51	.39	.70	.78
December	157	93	120	.61	.36	.46	.53
The period	392	93	150	1.51	.36	.58	1.31

Monthly Discharge of Speed River at Hespeler for 1914

Drainage Area, 259 Square Miles

Month.	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	418	90	144	1.61	.35	.56	.64
February	350	138	203	1.35	.53	.78	.81
March	1,415	118	406	5.46	.46	1.57	1.81
April	935	215	352	3.61	.83	1.36	1.52
May	297	113	166	1.15	.44	.64	.74
June	145	65	103	.56	.25	.40	.45
July	75	27	55	.29	.10	.21	.24
August	97	12	62	.38	.05	.24	.28
September	195	25	82	.75	.10	.32	.36
October	62	18	47	.24	.07	.18	.21
November	167	19	64	.64	.07	.25	.28
December	195	10	68	.75	.04	.27	.31
The Year	1,415	10	146	5.46	.04	.56	7.65

Galt Creek at Galt

Location.—At the Kerr Street bridge in the Town of Galt, County of Waterloo.

Records Available.—July 9th, 1913, to Dec. 31st, 1914.

Drainage Area.—48 square miles.

Gauge.—Vertical staff, 0 ft.—9 ft. on the right abutment. Elev. of zero on gauge is 891.00, which has remained unchanged since established.

Channel.—In the early part of the summer of 1914 this channel was narrowed on the left bank, making a new discharge curve necessary.

Discharge Measurements.—Made from the upstream side of the bridge at all stages.

Control.—The dam located above this section has little effect on the river stage, and the flow can be called natural.

Winter Flow.—During the months of December to the middle of March, ice greatly affects the relation between gauge height and discharge. Winter measurements are made to determine this flow.

Accuracy.—The records on this stream can be classed as good.

Observer.—Charles Parker.

Discharge Measurements of Galt Creek near Galt in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
July 9....	Robert, E.	24	17	1.39	893.31	23	....
Aug. 20....	"	24	15	1.27	893.22	19	....
Sept. 15....	"	24	13	1.31	893.19	17	....
Oct. 24....	"	24	25	.98	893.66	24	....
Nov. 24....	"	24	32	2.86	894.08	92	....
Dec. 9....	"	24	23	.94	893.51	22	....
1914							
Jan. 27 (a).	"	20	13	1.67	844.50	22	....
Feb. 24 (a).	"	16	11	1.58	893.58	17	....
April 4....	"	24	35	3.41	894.23	119	....
" 4....	"	24	28	3.67	894.20	103	....
" 24....	"	18	20	1.84	893.50	36	....
June 1....	"	14	11	1.00	893.33	11	....
July 6....	"	24	13	.75	893.18	9	....
" 6....	"	24	13	.69	893.16	9	....
" 24....	"	24	12	.72	893.19	8	....
" 24....	"	24	12	.80	893.19	9	....
" 25....	"	24	12	.74	893.19	8	....
Aug. 7....	"	24	13	.74	893.25	9	....
" 25....	"	24	15	.70	893.31	10	....
" 25....	"	24	15	.70	893.31	10	....
Sept. 9....	"	24	18	.88	893.42	16	....
" 9....	"	24	19	.93	893.43	17	....
" 9....	"	24	18	.88	893.42	16	....
" 18....	"	24	17	.83	893.40	14	....
" 18....	"	24	17	.83	893.40	14	....
Oct. 17....	"	24	15	.94	893.40	14	....
" 17....	"	24	15	.91	893.40	14	....
" 26....	"	24	15	.84	893.35	13	....
" 26....	"	24	15	.83	893.35	12	....
Nov. 17....	"	24	28	1.76	893.89	50	....
" 17....	"	24	28	1.82	893.90	52	....
Dec. 3....	"	24	26	1.84	893.79	47	....
" 3....	"	24	25	1.60	893.77	40	....

(a) Ice conditions

Daily Gauge Height and Discharge of Galt Creek at Galt for 1913

Drainage Area 48 Square Miles

Day	January Gauge Ht.	January Dis-charge	February Gauge Ht.	February Dis-charge	March Gauge Ht.	March Dis-charge	April Gauge Ht.	April Dis-charge	May Gauge Ht.	May Dis-charge	June Gauge Ht.	June Dis-charge	July Gauge Ht.	July Dis-charge	August Gauge Ht.	August Dis-charge	September Gauge Ht.	September Dis-charge	October Gauge Ht.	October Dis-charge	November Gauge Ht.	November Dis-charge	December Gauge Ht.	December Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1															893.20	15	893.33	25	893.33	25	893.35	25	893.49	32
2															893.23	17	893.25	20	893.44	36	893.35	25	893.54	35
3															893.23	17	893.29	23	893.48	39	893.38	26	893.57	37
4															893.31	25	893.29	23	893.33	25	893.45	30	893.50	33
5															893.21	16	893.33	25	893.40	32	893.44	30	893.37	26
6															893.23	17	893.27	23	893.54	44	893.37	26	893.38	26
7															893.43	33	893.23	17	893.31	25	893.34	24	893.45	30
8															893.23	17	893.27	23	893.35	27	893.49	32	893.46	31
9															893.31	25	893.25	20	893.35	27	893.85	61	893.56	37
10													893.31	25	893.56	45	893.31	25	893.44	36	893.83	59	893.50	33
11															893.63	52	893.29	23	893.40	32	894.04	85	893.56	37
12															893.42	33	893.23	17	893.46	36	893.79	55	893.66	44
13															893.50	40	893.27	23	893.46	36	893.69	46	893.42	28
14															893.29	23	893.27	27	893.37	28	893.69	46	803.59	39
15															893.31	25	893.19	15	893.50	40	893.67	45	893.71	48
16															893.32	25	893.23	17	893.42	33	893.60	39	893.50	33
17															893.31	25	893.44	36	893.48	39	893.65	43	893.44	30
18															893.27	22	893.39	31	893.48	39	893.48	32	893.44	30
19															893.23	17	893.35	27	893.49	39	893.77	53	893.62	41
20															893.22	17	893.50	40	893.50	40	804.08	81	893.52	34
21															893.46	36	893.54	44	893.50	40	894.04	81	893.42	28
22													893.29	23	893.31	25	893.50	40	893.56	46	894.04	81	893.49	32
23													893.31	25	893.33	25	893.30	32	893.50	40	893.89	66	893.50	35
24													893.29	23	893.40	32	893.46	36	893.56	46	893.81	57	893.59	39
25													893.28	23	893.31	25	893.36	27	893.72	59	893.64	42	893.46	31
26													893.29	23	893.31	25	893.35	27	893.60	49	893.58	38	893.85	61
27													893.28	23	893.27	23	893.37	28	893.56	46	893.55	36	894.23	19
28													893.27	22	893.52	41	893.40	32	893.31	25	893.56	37	894.00	80
29													893.25	20	893.31	25	893.44	36	893.50	40	893.51	34	893.92	70
30													893.23	17	893.33	25	893.35	27	893.47	39	893.51	34	893.68	45
31													893.21	16	893.31	25			893.40	32			893.77	53

Note: July 10 row also printed as 893.21 / 16 for day 31 continuation per table.

Daily Gauge Height and Discharge of Galt Creek at Galt for 1914

Drainage Area, 48 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	893.49	32	894.71	30	893.64	18	894.16	103	893.54	35	893.33	12	893.25	10	893.19	8	893.54	24	893.33	10	893.49	20	893.64	32
2	893.64	42	894.52	25	893.77	19	894.14	100	893.56	37	893.30	11	893.25	10	893.37	14	893.94	58	893.31	11	893.48	19	893.74	40
3	893.64	42	894.50	22	893.31	16	894.20	109	893.48	32	893.33	12	893.25	10	893.33	12	893.76	41	893.32	11	893.48	19	893.74	40
4	893.68	46	894.31	18	893.45	15	894.14	100	893.50	33	893.37	14	893.24	9	893.34	12	893.39	24	893.28	10	893.46	18	893.71	37
5	893.85	61	894.23	17	893.50	15	893.95	73	893.54	35	893.37	14	893.21	9	893.32	11	893.50	21	893.26	10	893.37	14	893.61	30
6	893.89	66	894.37	22	893.52	18	893.81	57	893.73	50	893.37	14	893.20	9	893.28	10	893.47	20	893.29	11	893.38	14	893.48	19
7	893.66	44	894.16	18	893.58	20	893.66	44	893.89	66	893.42	16	893.16	8	893.26	10	893.46	18	893.25	10	893.34	12	893.37	14
8	893.71	48	894.25	16	893.64	20	893.62	41	893.79	55	893.68	35	893.18	8	893.25	10	893.48	20	893.33	12	893.33	12	893.66	33
9	893.64	42	894.18	20	893.68	18	893.64	42	893.71	48	893.64	32	893.30	11	893.25	10	893.42	16	893.30	11	893.37	14	893.74	44
10	893.62	41	894.00	18	893.42	17	893.58	38	893.62	41	893.50	21	893.27	10	893.29	11	893.35	13	893.43	17	893.39	15	893.81	46
11	893.58	38	893.81	16	893.45	18	893.52	34	893.56	37	893.41	15	893.27	10	893.26	10	893.34	13	893.53	24	893.36	13	893.68	34
12	893.79	55	893.66	13	893.52	25	893.46	31	893.54	35	893.34	12	893.25	10	893.32	11	893.31	11	893.59	28	893.33	12	893.68	34
13	893.64	42	893.58	13	893.42	29	893.42	28	893.58	38	893.29	11	893.27	10	893.32	11	893.25	10	893.46	18	893.48	19	893.75	38
14	893.48	32	893.56	12	893.89	66	893.42	28	893.60	39	893.25	10	893.25	10	893 31	11	893.29	11	893.44	17	893.51	22	893.92	50
15	893.44	30	893.46	11	894.73	200	893.44	29	893.52	34	893.26	10	893.30	10	893.26	10	893.20	9	893.41	16	893.66	33	894.37	120
16	893.48	32	893.37	10	895.12	268	893.39	27	893.50	33	893.20	9	893.27	10	893.25	10	893.26	10	893.41	16	893.83	47	894.25	95
17	893.64	42	893.42	9	894.81	180	893.33	23	893.46	31	893.20	9	893.25	10	893.23	9	893.29	11	893.37	14	893.82	47	893.59	80
18	894.14	48	893.44	9	895.33	305	893.42	28	893.44	30	893.25	10	893.21	9	893.31	11	893.28	10	893.45	18	893.66	33	893.48	68
19	894.35	58	893.37	9	894.64	186	893.46	31	893.37	26	893.26	10	893.18	8	893.37	14	893.43	17	893.44	17	893.64	32	893.44	62
20	893.87	35	893.42	10	894.45	153	893.58	38	893.35	25	893.25	10	893.19	9	893.44	17	893.29	11	893.38	14	894.16	82	893.40	51
21	894.04	40	893.39	10	894.29	125	893.64	42	893.33	24	893.27	10	893.17	8	893.65	33	893.25	10	893.35	13	893.83	47	893.46	48
22	893.44	30	893.44	12	893.92	70	893.50	33	893.35	25	893.29	11	893.16	8	893.58	27	893.25	10	893.33	12	893.48	19	893.46	42
23	893.89	35	893.58	14	893.85	62	893.48	32	893.35	25	893.44	17	893.17	8	893.44	17	893.28	10	893.35	13	893.75	41	893.56	35
24	894.27	18	893.62	18	893.72	49	893.46	31	893.35	26	893.33	12	893.17	8	893.34	12	893.28	10	893.32	11	893.89	53	893.58	28
25	894.64	27	893.54	16	893.79	55	893.48	32	893.37	26	893.26	10	893.26	10	893.28	11	893.31	11	893.32	11	893.42	12	893.42	22
26	894.60	24	893.44	14	894.02	82	893.75	51	893.39	27	893.25	10	893.24	9	893.28	11	893.31	11	893.34	12	893.44	17	893.48	16
27	894.48	22	893.39	13	894.52	165	893.73	50	893.42	28	893.21	9	893.20	9	893.25	10	893.35	13	893.33	12	893.51	22	893.54	20
28	894.58	24	893.48	14	894.45	153	893.54	35	893.46	31	893.27	9	893.18	8	893.28	11	893.26	10	893.33	12	893.54	24	893.53	19
29	894.77	30	......	.....	894.35	135	893.64	42	893.42	28	893.28	10	893.20	9	893.31	11	893.33	12	893.34	12	893.44	17	893.58	20
30	894.89	35	......	.....	894.29	125	893.58	38	893.37	26	893.25	10	893.19	8	893.27	10	893.26	10	893.42	12	893.51	22	893.56	20
31	894.66	33	......	.....	894.18	106	......	.....	893.35	25	......	.....	893.17	8	893.34	12	......	.....	893.48	19	......	.....	893.60	20

Monthly Discharge of Galt Creek at Galt for 1913

Drainage area 48 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	52	15	26	1.08	.31	.54	.62
September	44	15	27	.92	.31	.56	.62
October	59	25	37	1.23	.52	.77	.89
November	85	24	46	1.77	.50	.95	1.05
December	80	26	38	1.66	.54	.79	.91
The period	85	15	35	1.77	.31	.72	4.09

Monthly Discharge of Galt Creek, at Kerr St. Bridge, Galt for 1914

Drainage area 48 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	66	18	38	1.37	.375	.805	.93
February	30	9	15	.62	.19	.32	.32
March	305	15	88	6.35	.31	1.834	2.11
April	109	23	46	2.27	.48	.967	1.08
May	66	24	33	1.37	.50	.706	.82
June	35	9	13	.73	.19	.275	.31
July	11	8	9	.23	.17	.19	.22
August	33	8	12	.69	.17	.26	.30
September	58	9	15	1.21	.14	.33	.37
October	28	10	14	.58	.21	.29	.33
November	82	12	25	1.71	.25	.54	.60
December	120	14	40	2.50	.29	.84	.97
The year	305	8	29	6.35	.17	.61	8.36

Nith River near Canning

Location—At the bridge 200 feet upstream from the Grand Trunk Ry. bridge, lot 2, Concession 2, Township of Blenheim, County of Oxford, 1 mile from the Village of Canning.

Records Available—July 5th, 1913, to Dec. 31st, 1914.

Drainage Area—386 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on left abutment. Elev. of zero on gauge is 799.00, which has remained unchanged since established.

Channel—Slightly shifting bed; both banks practically permanent.

Discharge Measurements—Made from the upstream side of bridge, and at low-water period a permanent cross-section located 150 feet upstream is used.

Winter Flow—The relation between gauge height and discharge is affected by ice from the middle of December to the middle of March. Measurements are made to determine this flow.

Control—About 1½ miles above this section is a milling plant, the operation of which causes variations in the river stage.

Accuracy—Data at present available are insufficient to determine curve definitely for flows over 200 sec.-ft.

Observer—Lewis Baker.

Discharge Measurements of Nith River near Canning in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
July 2....	Roberts, E	105	116	1.38	801.17	161	....
Aug. 15....	"	105	128	1.47	801.29	188	....
Sept. 9....	"	105	143	1.35	801.34	193	....
Oct. 21....	"	75	90	2.05	801.25	184	....
Nov. 7....	"	70	82	1.68	801.08	139	....
Dec. 8....	"	110	161	1.48	801.54	240	....
1914							
Jan. 23 (a)	"	90	89	1.81	801.95	163	....
Feb. 24 (a)	"	105	158	1.17	803.08	185	....
Mar. 30....	"	120	452	3.30	804.00	1493	....
April 3....	"	110	514	4.46	804.67	2292	....
May 1....	"	73	145	2.61	801.75	378	....
" 29....	"	90	77	1.71	801.18	132	....
July 3....	"	90	60	1.46	800.85	88	....
" 3....	"	90	52	1.42	800.77	74	....
" 16....	"	92	64	1.73	800.99	112	....
" 18....	"	90	76	1.89	801.17	143	....
" 18....	"	90	65	1.56	800.96	101	....
Aug. 6....	"	90	67	1.54	801.00	103	....
" 6....	"	90	65	1.53	801.00	100	....
" 18....	"	90	58	1.45	800.82	84	....
" 18....	"	90	58	1.49	800.83	86	....
Sept. 5....	"	93	91	2.08	801.33	189	....
" 5....	"	93	94	2.05	801.34	193	....
" 5....	"	93	92	1.99	801.31	183	....
" 22....	"	92	73	1.73	801.03	126	....
" 22....	"	92	74	1.89	801.05	142	....
" 22....	"	92	80	1.87	801.08	150	....
Oct. 14....	"	91	62	1.49	800.91	93	....
" 14....	"	91	63	1.58	800.95	100	....
" 21....	"	93	68	1.56	800.98	106	....
" 21....	"	93	64	1.51	800.95	97	....
Nov. 14....	"	93	74	1.66	801.04	123	....
" 14....	"	93	74	1.75	801.05	130	....
" 14....	"	93	73	1.69	801.04	124	....
Dec. 4....	"	98	151	2.92	802.20	441	....

(a) Ice conditions

Daily Gauge Height and Discharge of Nith River, near Canning for 1913

Drainage Area, 386 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.88	105	800.78	88	801.11	148	801.39	212	801.58	285
2	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.86	102	800.90	110	800.99	122	801.20	170	801.58	285
3	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.76	86	801.07	139	801.07	139	801.21	172	801.48	250
4	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.67	73	801.15	155	801.20	165	801.21	172	801.62	298
5	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.17	162	800.96	122	800.11	147	800.90	110	801.25	183	801.50	257
6	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.46	225	801.05	134	801.07	139	800.63	74	801.19	168	801.29	192
7	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.26	183	801.01	125	800.84	98	801.01	126	801.15	156	801.18	165
8	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.38	200	801.07	139	801.01	125	801.11	148	801.35	210	800.93	100
9	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.30	190	801.07	139	801.34	193	801.03	128	801.27	188	801.48	250
10	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.13	148	801.76	292	801.11	137	800.88	106	801.85	385	801.60	290
11	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.30	190	801.46	226	800.82	93	800.82	93	801.65	308	801.37	217
12	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.17	161	801.09	143	801.03	130	800.94	116	801.52	262	801.06	133
13	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.21	170	801.38	204	800.82	93	800.84	98	801.35	210	801.54	270
14	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.96	122	801.13	148	800.92	113	801.09	142	801.58	285	801.44	238
15	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.13	148	801.29	188	800.69	75	801.03	128	801.52	262	801.39	212
16	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.05	134	801.30	190	801.05	134	800.89	108	801.58	285	801.44	238
17	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.07	139	801.19	160	801.09	142	801.21	168	801.66	310	801.39	212
18	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.07	139	801.13	148	800.86	102	801.10	145	801.48	250	801.42	230
19	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.11	147	801.05	134	800.99	122	800.98	123	801.58	285	801.31	200
20	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.30	40	800.90	110	800.72	79	801.00	124	803.73	1480	801.39	212
21	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800 60	70	800.94	118	800.92	113	801.25	185	804.13	1780	801.48	250
22	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.96	122	800.92	114	801.01	125	801.23	170	802.31	600	801.21	172
23	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.05	134	801.11	148	801.28	185	801.27	188	802.67	790	801.02	122
24	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.96	122	801.09	143	801.05	134	801.37	208	804.63	2150	801.83	380
25	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.01	130	800.78	88	800.97	126	801.39	210	802.70	812	801.50	257
26	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.88	105	600.82	93	801.05	134	801.29	188	802.37	630	801.37	217
27	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.92	113	801.01	125	801.13	148	801.35	204	801.59	287	801.42	230
28	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	801.09	143	801.19	162	800.92	113	801.25	180	801.87	390	801.48	250
29	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.94	116	800.99	122	800.80	90	801.33	198	801.77	352	802.25	568
30	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.88	105	801.07	139	801.09	142	801.31	192	801.60	290	802.29	587
31	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	800.94	116	800.97	120	......	.....	801.35	204	......	.....	802.33	610

Daily Gauge Height and Discharge of Nith River near Canning for 1914

Drainage Area, 386 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	802.46	680	803.96	755	801.62	120	803.75	1485	801.73	338	800.62	40
2	802.04	470	803.04	580	801.56	100	804.04	1710	801.73	338	800.81	80
3	801.71	330	802.64	505	801.60	100	804.58	2130	801.66	310	801.16	160
4	801.42	230	802.52	485	801.75	100	803.27	1165	802.83	890	801.18	165
5	801.66	310	802.37	495	801.94	105	802.66	785	802.46	680	800.83	82
6	801.71	330	802.52	540	802.12	120	802.27	575	802.08	485	801.23	180
7	801.64	304	802.56	500	802.18	145	802.16	520	801.87	390	801.27	190
8	801.37	217	802.44	470	802.10	170	802.20	544	801.62	298	802.42	655
9	801.48	250	802.62	450	802.37	195	802.04	470	801.48	250	801.42	230
10	801.62	298	803.50	405	802.31	200	801.54	270	801.39	212	801.31	200
11	801.83	380	803.52	365	802.31	185	801.83	380	801.42	230	801.29	192
12	802.04	470	803.67	325	802.42	170	801.71	330	801.54	270	801.29	192
13	802.21	550	803.42	290	802.16	155	801.71	330	801.48	250	801.04	130
14	802.37	630	803.46	255	802.48	685	801.64	306	801.52	262	800.98	108
15	802.04	470	803.20	225	803.29	1185	801.69	322	801.31	200	801.06	124
16	801.87	395	803.06	175	804.98	2470	801.64	306	801.39	212	800.94	100
17	802.10	495	802.86	175	805.29	2740	801.71	330	801.29	192	801.02	116
18	802.00	450	803.04	195	804.25	1860	801.64	306	801.35	210	800.92	98
19	801.96	430	803.25	215	804.62	2150	801.16	160	801.29	192	801.25	168
20	802.12	150	803.20	240	803.00	990	801.46	242	801.31	200	800.96	104
21	802.04	120	803.33	240	802.58	745	801.54	270	801.46	240	800.62	56
22	802.10	150	803.12	230	802.46	677	801.87	390	801.75	345	801.00	112
23	802.08	150	803.02	210	802.18	532	801.83	376	800.85	87	801.06	124
24	802.12	150	803.04	185	802.08	485	801.62	298	801.10	134	801.08	128
25	801.92	165	802.96	185	802.04	470	801.75	345	801.18	165	801.02	116
26	802.14	190	803.12	160	802.42	660	801.96	430	801.25	183	800.89	92
27	801.95	145	803.12	150	804.00	1680	801.92	415	801.23	177	801.06	124
28	801.29	100	803.20	130	806.66	4080	801.79	360	801.23	177	800.79	78
29	802.77	170	......	.....	805.75	3170	801.81	370	801.14	155	800.96	104
30	804.54	870	......	.....	803.92	1620	801.73	338	801.08	138	801.08	128
31	804.71	930	......	.....	805.50	2940	......	.....	800.89	92	......	.....

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	800.96	112	800.83	84	801.14	142	801.04	122	801.10	134	802.12	505
2	800.85	86	800.62	56	802.00	450	801.02	116	801.10	134	802.73	825
3	800.87	90	800.52	46	801.66	310	800.81	80	801.23	164	802.35	619
4	800.83	84	800.66	60	801.29	192	800.64	58	201.12	138	802.10	496
5	801.08	128	800.71	68	801.39	212	800.96	104	801.14	142	801.83	376
6	800.96	104	800.65	60	800.92	98	801.16	160	801.06	124	801.64	306
7	800.92	98	800.71	68	800.77	75	801.02	116	801.02	116	801.71	330
8	800.96	104	800.69	64	800.42	36	800.94	101	800.85	86	801.77	348
9	800.98	108	800.60	54	800.27	22	800.56	50	800.92	98	801.79	360
10	800.79	78	800.52	46	800.35	30	801.12	138	801.02	116	802.20	428
11	800.62	56	800.81	80	800.29	23	801.08	128	800.98	108	801.92	308
12	800.50	44	800.62	56	800.20	16	801.06	124	801.04	122	801.60	198
13	800.79	78	800.79	78	800.31	26	801.16	160	801.02	116	801.68	222
14	800.79	78	800.79	78	800.27	22	801.37	202	801.20	156	801.64	210
15	801.08	128	800.62	56	800.25	20	800.92	98	801.31	200	801.62	202
16	801.02	116	800.75	72	800.29	23	801.02	116	801.52	262	801.68	198
17	801.04	120	800.56	50	800.39	32	801.29	192	801.96	430	801.73	212
18	800.81	80	800.83	84	800.42	36	800.94	101	801.85	384	801.79	212
19	801.00	112	801.00	112	800.94	102	801.02	116	801.81	362	801.68	178
20	800.87	90	801.12	138	801.02	116	801.02	116	801.79	360	801.77	160
21	800.92	98	801.19	159	800.52	46	800.83	84	801.68	312	801.79	138
22	800.77	74	801.03	118	801.02	116	800.92	98	801.68	312	801.73	124
23	800.69	64	801.12	138	801.12	138	801.02	116	802.14	516	801.62	103
24	800.81	80	800.92	98	801.04	120	800.85	86	801.87	390	801.71	122
25	800.85	86	800.64	58	801.10	134	800.89	92	801.81	366	801.68	115
26	800.90	94	800.75	66	801.08	128	800.96	104	801.62	288	801.81	142
27	800.42	36	800.62	56	800.87	90	801.02	116	801.87	390	801.75	128
28	800.92	98	800.79	78	800.46	40	800.89	90	802.04	470	801.81	130
29	800.81	80	800.85	86	801.04	120	801.02	116	802.23	558	801.85	133
30	800.66	60	800.81	80	801.14	142	800.98	110	802.12	505	801.85	133
31	800.66	60	800.71	68	......	.....	801.10	134	......	.....	801.87	134

Monthly Discharge of Nith River near Canning for 1913

Drainage Area, 386 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
*July	225	40	145	.58	.10	.38	.44
August	292	73	140	.76	.19	.36	.42
September	193	75	124	.50	.19	.32	.36
October	210	74	150	.54	.19	.39	.45
November	2,150	156	468	5.57	.404	1.21	1.35
December	610	100	264	1.58	.259	.684	.78
The period	2,150	40	215	5.57	.10	.559	3.80

* Portion of month only.

Monthly Discharge of Nith River near Canning for 1914

Drainage Area 386 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in inches on Drainage Area
January	930	100	354	2.41	.259	.917	1.06
February	755	130	326	1.956	.337	.821	.879
March	4,080	100	1,000	10.57	.259	2.59	2.99
April	2,130	160	542	5.52	.415	1.404	1.56
May	890	87	267	2.31	.225	.692	.79
June	655	40	146	1.69	.104	.378	.43
July	128	36	88	.332	.093	.228	.26
August	154	46	78	.399	.114	.202	.23
September	450	16	102	1.165	.041	.264	.29
October	202	50	114	.523	.130	.295	.34
November	558	86	262	1.45	.22	.68	.75
December	825	103	261	2.14	.27	.68	.78
The year	4,080	16	295	10,57	.04	.76	10.36

Whiteman's Creek near Burford

Location.—At the first concrete bridge above its confluence with the Grand River, lot 14, concession 3, Township of Brantford, County of Brant.

Records Available.—June 30th, 1913, to Dec. 31st, 1914.

Drainage Area.—153 square miles.

Gauge.—Vertical staff, 0 ft.—12 ft. on the left abutment. Elev. of zero on the gauge is 690.00, which has remained unchanged since established.

Channel.—Permanent under ordinary conditions.

Control.—Changed about June 8th, 1914.

Discharge Measurements.—From the downstream side of the bridge at all stages.

Floods.—On June 8th, 1914, violent rains caused this stream to raise 6 feet, and causing change in control noted above.

Winter Flow.—Ice affects the relation between gauge height and discharge. Winter readings were taken to determine this flow up to the first week in February, 1914, when the stream became choked with slush ice.

Accuracy.—The mill that is located about 2 miles above, known as App's Mill, causes fluctuations in the river stage at this section.

Observer.—J. Roy Davis.

Discharge Measurements of Whiteman's Creek near Burford in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
June 30....	Roberts, E	64	36	1.02	690.82	37	....
Aug. 14....	"	64	41	1.12	690.94	46	....
Sept. 12....	"	49	30	.98	690.72	29	....
Oct. 8....	"	54	36	1.03	690.84	37	....
Nov. 5....	"	64	46	1.08	691.05	49	....
Dec. 4....	"	64	59	1.43	691.30	85	....
" 27....	"	64	40	1.16	691.00	46	....
1914							
Jan. 11....	"	64	47	1.18	691.08	55	....
Mar. 19....	"	64	103	2.80	691.92	290	....
" 29....	"	64	164	4.28	692.83	701	....
April 2....	"	64	162	4.09	692.65	662	....
" 2....	"	64	161	4.04	692.65	651	....
" 8....	"	64	92	2.25	691.76	203	....
May 20....	"	64	55	1.47	691.19	81	....
" 21....	"	64	57	1.38	691.18	78	....
" 23....	"	64	63	1.46	691.25	92	....
" 27....	"	64	84	2.30	691.64	193	....
June 17....	"	64	47	1.85	691.00	86	....
" 17....	"	64	47	2.02	691.04	94	....
" 20....	"	63	40	1.85	690.92	74	....
" 21....	"	63	40	1.83	690.92	73	....
" 25....	"	50	30	1.50	690.75	46	....
" 26....	"	50	31	1.48	690.75	46	....
July 4....	"	50	31	1.40	690.75	44	....
" 4....	"	50	32	1.45	690.75	46	....
" 15....	"	63	38	1.74	690.87	66	....
" 15....	"	63	38	1.70	690.87	64	....
" 28....	"	55	32	1.43	690.75	45	....
" 28....	"	55	32	1.40	690.75	45	....
Aug. 16....	"	50	21	1.14	690.57	24	....
" 16....	"	50	19	.95	690.52	18	....
" 17....	"	57	33	1.51	690.78	50	....
" 17....	"	57	33	1.45	690.77	48	....
Sept. 4....	"	64	75	2.70	691.47	203	....
" 4....	"	64	77	2.73	691.48	212	....
" 6....	"	64	53	2.03	691.10	108	....
" 12....	"	55	33	1.40	690.76	46	....
" 19....	"	50	18	.93	690.50	16	....
" 28....	"	55	33	1.41	690.76	47	....
" 29....	"	55	33	1.44	690.77	48	....
" 29....	"	55	33	1.42	690.76	47	....
Oct. 13....	"	56	33	1.50	690.80	50	....
" 13....	"	58	37	1.67	690.87	63	....
" 13....	"	59	41	1.77	690.93	72	....
Nov. 12....	"	57	33	1.47	690.80	49	....
" 12....	"	58	36	1.53	690.83	56	....
Dec. 8....	"	65	49	1.82	691.04	90	....

Daily Gauge Height and Discharge of Whiteman's Creek near Burford for 1913

Drainage Area 153 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1													690.82	37							691.04	58	691.25	91
2																					690.88	38	691.21	83
3																					690.96	47	691.23	87
4																					691.02	55	691.19	80
5																					691.02	55	691.10	67
6																					690.96	47	691.12	70
7																					690.98	49	691.17	77
8																			690 84	37	690.94	45	691.08	64
9																					691.15	74	691.08	64
10																					691.33	107	691.17	77
11																					691.40	124	691.29	100
12																	690.72	29			691.29	100	691.04	58
13																					691.27	95	691.06	61
14															690.94	46					691.29	100	691.04	58
15																			690.83	36	691.37	116	691.04	58
16																			690.81	35	691.31	103	691.10	67
17																			690.85	38	691.25	91	691.04	58
18																			690.85	38	691.25	91	691.04	58
19																			690.83	36	691.31	103	691.08	64
20																			690.88	41	691.65	192	691.14	72
21																			690.96	48	691.81	243	691.04	58
22																			690.94	46	691.79	238	691.08	64
23																			690.44	46	691.67	197	690.83	33
24																			691.00	53	691.62	183	691.06	61
25																			691.08	61	691.54	160	691.00	52
26																			691.00	53	691.46	137	691.00	52
27																			690.88	41	691.42	128	690.96	47
28																			691.00	53	691.33	107	690.96	47
29																			691.04	56	691.29	100	691.12	70
30																			691.02	54	691.25	91	690.97	48
31																			691.00	53			691.08	64

Daily Gauge Height and Discharge of Whiteman's Creek near Burford for 1914

Drainage Area, 153 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	691.00	52	692.75	192	692.75	60	692.52	538	691.71	210	691.10	67	690.85	60	690.71	37	691.04	92	690.66	31	690.71	37	691.27	140
2	691.21	83	692.37	150	692.37	56	692.56	560	691.53	160	691.02	55	690.81	52	690.60	25	691.92	330	690.71	37	690.77	46	691.44	184
3	691.06	61	692.79	177	692.79	55	692.66	617	691.46	137	690.96	45	690.77	46	690.60	25	691.64	240	690.58	23	690.71	37	691.54	210
4	690.94	45	692.79	177	692.79	52	692.46	507	691.44	133	691.16	181	690.75	43	690.66	31	691.46	187	690.60	25	690.71	37	691.37	163
5	691.42	128	692.85	150	692.85	52	692.10	350	691.58	171	691.23	100	690.75	43	690.56	21	696.18	120	690.60	25	690.73	40	691.27	138
6	691.29	115	692.73	135	692.83	52	691.96	300	692.27	417	691.19	90	690.71	37	690.46	12	691.10	104	690.71	37	690.68	34	691.14	113
7	690.95	46	692.62	123	692.71	52	691.77	230	693.04	840	691.16	81	690.66	31	690.66	31	691.00	85	690.62	27	690.73	40	691.10	104
8	690.87	37	692.54	112	692.54	52	691.75	225	692.08	345	693.37	1,050	690.71	37	690.42	10	691.02	87	690.58	23	690.71	37	691.06	95
9	691.00	38	692.35	100	692.35	52	191.60	178	691.98	305	694.47	1,935	690.71	37	690.42	10	690.94	75	690.66	31	690.75	43	690.98	98
10	690.89	39	692.24	100	692.22	52	691.54	160	691.71	210	692.37	462	690.71	37	690.68	34	690.87	63	690.77	46	690.75	43	691.00	85
11	691.08	63	691.58	97	691.58	52	691.48	144	691.54	160	691.77	278	690.66	31	690.68	34	690.77	46	690.79	50	690.68	34	690.89	66
12	691.04	56	691.23	92	691.23	52	691.48	144	691.58	171	691.44	182	690.66	31	690.71	37	690.71	37	690.77	46	690.58	23	690.92	72
13	691.25	56	691.16	76	691.12	70	691.47	140	691.81	243	691.21	126	690.66	31	690.71	37	690.71	37	690.71	37	690.68	34	690.87	63
14	691.18	56	691.33	108	691.33	107	691.35	112	691.66	195	691.12	108	690.75	43	690.68	34	690.71	37	690.79	50	690.66	31	690.92	72
15	691.29	56	693.33	100	691.79	238	691.29	100	691.54	160	691.04	92	690.79	50	690.56	21	690.71	37	690.75	43	690.81	52	691.35	160
16	691.33	56	693.31	97	692.16	375	691.29	100	691.39	121	690.92	70	690.73	40	690.53	20	690.73	40	690.77	46	691.14	113	691.35	160
17	691.29	56	693.18	95	692.31	460	691.37	116	691.35	112	690.89	67	690.73	40	690.66	31	690.62	27	690.60	25	691.20	125	691.04	92
18	691.29	56	693.12	92	692.46	506	691.35	112	691.25	91	690.85	60	690.66	31	690.66	31	690.75	43	690.75	43	691.23	131	691.06	95
19	691.29	66	693.04	92	692.08	340	691.33	107	691.20	81	690.92	72	690.65	30	690.50	17	690.58	23	690.77	46	690.96	77	691.16	115
20	691.27	72	693.04	92	691.75	225	691.39	121	691.10	67	690.92	72	690.70	36	690.85	60	690.64	29	690.73	40	691.16	115	691.00	85
21	691.38	75	693.08	90	691.58	150	691.39	121	691.14	73	690.87	64	690.62	27	690.85	60	692.62	27	690.83	56	691.33	155	691.00	85
22	691.38	76	692.79	83	691.42	128	691.39	121	691.16	76	690.92	72	690.66	31	690.76	46	690.68	34	690.62	27	690.92	72	691.31	85
23	691.42	76	692.79	66	691.35	112	691.35	112	691.14	73	690.54	20	690.65	30	690.79	50	690.79	50	690.66	31	691.06	95	691.20	83
24	691.39	73	692.66	57	691.32	105	691.27	95	691.12	70	690.88	65	690.69	35	690.73	40	690.73	40	690.77	46	690.96	77	691.39	85
25	691.18	69	692.81	57	691.35	112	691.39	121	691.16	76	690.81	52	690.56	21	690.77	46	690.81	52	690.66	31	690.89	66	691.37	83
26	691.33	67	692.66	66	691.70	209	692.44	500	691.29	100	690.83	56	690.58	23	690.71	37	690.62	27	690.73	40	690.89	66	691.42	82
27	691.18	75	692.83	73	692.20	390	692.42	486	691.46	137	690.81	52	690.69	35	690.66	31	690.66	31	690.54	21	691.08	101	691.46	82
28	691.29	92	692.79	70	693.10	875	691.94	291	691.83	248	690.83	56	690.66	31	690.73	40	690.73	40	690.54	21	691.18	120	691.39	81
29	691.62	127	......	......	692.79	690	691.75	295	691.54	160	690.87	64	690.60	25	690.71	37	690.66	31	690.75	43	691.18	120	691.62	80
30	692.25	192	......	......	692.50	528	691.68	199	691.25	91	690.85	60	690.54	21	690.66	31	690.58	23	690.60	25	691.18	120	691.68	81
31	692.08	240	......	......	692.62	592	......	......	691.23	87	......	......	690.65	30	690.60	25	......	......	690.74	42	......	......	691.56	78

Monthly Discharge of Whiteman's Creek near Burford for 1913

Drainage Area, 153 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	....	....	....	....	....	....	....
August	....	....	....	....	....	....	....
September	....	....	....	....	....	....	....
October	....	....	....	....	....	....	....
November	243	38	109	1.59	.25	.712	.79
December	100	47	64	.65	.31	.42	.48
The period	243	38	86	1.59	.25	.57	1.27

Monthly Discharge of Whiteman's Creek near Burford for 1914

Drainage Area, 153 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	240	37	77	1.57	.24	.50	.58
February	192	57	104	1.25	.37	.68	.71
March	875	52	221	5.72	.34	1.44	1.67
April	617	95	240	4.03	.62	1.57	1.75
May	840	67	178	5.49	.44	1.16	1.34
June	1,935	20	192	12.65	.13	1.26	1.41
July	60	21	35	.39	.14	.23	.26
August	60	10	32	.39	.07	.21	.24
September	330	23	69	2.16	.15	.46	.52
October	50	21	36	.33	.14	.24	.28
November	155	23	71	1.01	.15	.46	.52
December	210	63	103	1.37	.41	.67	.77
The year	1,935	10	113	12.65	.07	.74	10.05

Fairchild's Creek near Onondaga

Location.—At the highway bridge called Howell's Bridge, lot 16, concession 3, Township of Onondaga, County of Brant.

Records Available.—June 28th, 1913, to Dec. 31st, 1914.

Drainage Area.—112 square miles.

Gauge.—Vertical staff, 0 ft.—12 ft. on left abutment. Elev. of zero on the gauge is 621.00, which has remained unchanged since established.

Channel.—Clay and silt; decidedly shifting.

Discharge Measurements.—From the highway bridge at all stages.

Control—This stream is affected by back water from the Grand River during the high-water period.

Winter Flow—This gauge and cross-section was kept open all winter, the relation between gauge height and discharge not being affected by ice.

Accuracy—With the exception of the back water from the Grand River, which only lasts a day or two in the spring of the year, the results can be called good.

Observer—Gertrude Ludlow.

Discharge Measurements of Fairchild's Creek near Onondaga in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec–Feet	Discharge in Second-feet per Square Mile
1913							
June 28....	Roberts, E.	42	23	.91	622.16	21	....
Aug. 14....	"	42	27	.74	622.21	20	....
Sept. 3....	"	42	21	.62	622.05	13	....
Oct. 10....	"	45	22	.56	622.02	12	....
Nov. 3....	"	45	25	.75	622.10	18	....
Dec. 4....	"	46	34	1.09	622.28	38	....
" 25....	"	40	20	.65	622.00	13	....
1914							
Jan. 10....	"	40	22	.70	622.06	15	....
Feb. 9....	"	50	86	1.94	623.29	167	....
" 10....	"	50	70	1.58	622.85	111	....
" 10....	"	50	70	1.57	622.85	110	....
Mar. 20 (a)	"	55	106	1.71	623.67	182	....
" 24....	"	46	45	1.78	222.44	80	....
" 25....	"	44	41	1.55	622.33	64	....
" 26....	"	48	69	2.08	623.00	144	....
" 29....	"	75	325	1.89	627.42	616	....
April 2....	"	67	214	2.98	625.80	640	....
May 1 (b)	"	49	63	2.29	622.58	145	....
May 20....	"	47	34	1.32	622.25	45	....
" 21....	"	47	36	1.24	622.25	44	....
" 22....	"	47	33	1.11	622.18	36	....
" 27....	"	49	53	1.68	622.58	91	....
une 19....	"	44	24	.76	622,00	19	....
" 24....	"	45	23	.70	622.00	16	....
" 24....	"	45	23	.68	621.98	15	....
" 25....	"	45	22	.68	621.98	15	....
July 5....	"	45	20	.75	621.94	15	....
" 5....	"	45	20	.72	621.94	15	....
" 15....	"	45	20	.62	621.92	12	....
" 15....	"	45	20	.65	621.92	13	....
Aug. 1....	"	45	16	.48	621.83	7	....
" 3....	"	45	16	.48	621.83	8	....
" 13....	"	45	17	.51	621.84	8	....
" 13....	"	45	17	.50	621.83	8	....
" 17....	"	45	16	.48	621.83	7	....
" 17....	"	45	16	.48	621.83	7	....
Sept. 4....	"	45	25	.84	622.04	22	....
" 4....	"	45	25	.87	622.04	22	....
" 6....	"	45	24	.79	622.02	19	....
" 6....	"	45	24	.77	622.02	18	....
" 10....	"	45	17	.53	621.83	9	....
" 19....	"	45	16	.51	621.83	8	....
" 30....	"	45	17	.46	621.83	8	....
" 30....	"	45	17	.49	621.83	8	....
" 30....	"	45	17	.50	621.83	8	....
Oct. 13....	"	45	20	.60	621.92	12	....
" 13....	"	45	20	.60	621.92	12	....
Nov. 13....	"	45	19	.63	621.92	13	....
" 20....	"	45	26	.82	622.04	21	....
Dec. 7....	"	47	37	1.39	622.27	47	....

(a) Surface measurement (b) Old meter used.

Daily Gauge Height and Discharge of Fairchild's Creek near Onondaga for 1913

Drainage Area 112 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.02	13	622.04	15	622.04	15	622.06	20	622.25	40
2	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.04	15	622.04	15	622.04	15	622.04	17	622.25	40
3	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.04	15	622.05	15	622.06	15	622.04	17	622.21	36
4	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.06	15	622.04	15	622.06	15	622.04	15	622.06	20	622.23	38
5	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.14	21	622.06	15	622.04	15	622.00	13	622.08	22	622.21	36
6	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.29	36	622.06	15	622.04	15	622.00	13	622.08	22	622.16	30
7	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.14	20	622.04	15	622.04	15	622.04	15	622.04	17	622.16	30
8	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.12	19	622.04	15	622.00	13	622.02	13	622.04	17	622.18	33
9	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.07	16	622.00	13	622.04	15	622.12	25	622.10	24
10	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.10	17	622.24	29	622.00	13	622.06	15	622.50	68	622.25	40
11	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.22	28	622.54	65	622.00	13	622.04	15	622.62	82	622.12	25
12	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.10	17	622.31	38	622.00	13	622.04	15	622.42	59	622.12	25
13	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.24	29	622.20	27	621.97	11	622.06	15	622.33	49	622.10	24
14	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.20	26	622.14	20	621.97	11	622.04	15	622.39	55	622.08	22
15	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.12	18	622.08	16	622.00	13	622.06	15	622.44	61	622.04	17
16	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.04	15	622.02	14	622.04	15	622.35	51	622.06	20
17	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.04	15	622.04	15	622.04	15	622.27	42	622.12	25
18	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.10	17	622.06	15	622.08	16	622.06	15	622.25	40	622.12	25
19	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.12	19	622.04	15	622.08	16	622.08	16	622.27	42	622.08	22
20	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.04	15	622.06	15	622.08	16	622.98	126	622.06	20
21	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.04	15	622.12	17	622.08	16	623.27	165	622.06	20
22	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.12	19	622.06	15	622.20	26	622.08	16	623.35	175	622.06	20
23	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.20	27	622.10	17	622.04	15	622.75	98	622.04	17
24	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.22	29	622.08	16	622.10	17	622.58	76	622.06	20
25	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.12	17	622.04	15	622.16	19	622.52	70	622.06	20
26	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.08	16	622.04	15	622.25	32	622.42	58	622.06	20
27	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.06	15	622.02	13	622.14	18	622.35	51	622.02	16
28	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.04	15	622.02	13	622.08	16	622.33	49	622.04	17
29	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.08	16	622.12	17	622.04	15	622.10	17	622.29	44	622.02	16
30	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.12	17	623.04	15	622.12	17	622.25	40	622.02	16
31	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	622.04	15	622.08	16	......	.....	622.12	17	......	.....	622.04	17

Daily Gauge Height and Discharge of Fairchild's Creek near Onondaga for 1914

Drainage Area 112 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	622.00	15	623.96	262	622.10	24	625.20	503	622.58	76	622.12	25	621.98	18	621.81	4	622.01	20	621.87	9	622.00	19	622.18	34
2	622.00	15	623.46	189	622.35	48	625.92	695	622.44	61	622.08	22	621.94	14	621.84	7	622.31	47	621.83	6	621.94	14	622.31	48
3	621.98	13	622.81	106	622.50	68	626.42	840	622.39	56	622.00	15	621.97	17	621.83	6	622.28	42	621.85	7	621.94	14	622.52	71
4	622.02	16	623.00	129	622.62	80	624.20	302	622.23	38	622.06	20	621.96	16	621.85	7	622.01	20	621.85	7	621.96	16	622.51	70
5	622.02	16	623.00	129	622.87	112	623.08	142	622.29	45	622.29	44	621.94	14	621.85	7	622.01	20	621.87	9	621.96	16	622.39	56
6	622.04	17	623.06	136	622.83	108	622.87	118	625.73	643	622.23	38	621.92	13	621.85	7	622.00	15	621.85	7	621.94	14	622.33	50
7	622.02	16	622.89	120	622.50	68	622.73	100	628.77	1440	622.16	30	621.90	11	621.87	9	621.94	14	621.89	9	621.96	16	622.25	41
8	622.06	20	623.50	195	622.29	45	622.64	85	625.75	645	622.14	28	621.87	9	621.86	8	621.97	17	621.92	14	621.92	14	622.23	39
9	622.06	20	623.46	190	622.20	34	622.62	82	623.71	225	622.14	28	621.92	13	621.88	9	621.92	14	621.89	9	621.92	14	622.08	25
10	622.08	22	622.83	108	622.14	28	622.46	64	622.89	115	622.18	33	621.90	11	621.86	8	621.88	9	621.92	14	621.92	14	622.02	21
11	622.04	17	622.56	75	622.12	25	622.44	60	622.64	85	622.20	34	621.92	13	621.88	9	621.89	9	621.92	14	621.94	14	622.23	39
12	622.00	15	622.37	54	622.10	24	622.39	56	622.60	80	622.14	28	621.94	14	621.93	14	621.88	9	622.04	23	621.94	14	622.12	29
13	621.96	12	622.20	34	622.08	22	622.33	50	622.71	92	622.10	29	621.92	13	621.87	9	621.88	9	621.92	14	621.98	18	622.08	25
14	622.02	16	622.08	22	622.12	25	622.31	47	622.85	110	622.10	29	621.94	14	621.87	9	621.87	9	621.89	9	621.94	14	622.00	17
15	622.02	16	621.98	13	625.78	660	622.25	39	622.68	89	622.06	25	621.94	14	621.88	9	621.87	9	621.89	9	622.02	21	622.04	20
16	622.00	15	622.00	15	626.58	890	622.27	42	622.54	72	622.04	23	621.94	14	621.88	9	621.85	7	621.89	9	622.08	25	621.92	10
17	622.04	17	622.12	25	626.89	980	622.31	47	622.39	56	621.98	18	621.88	9	621.85	7	621.85	7	621.92	14	622.29	46	621.92	10
18	622.12	25	622.16	30	626.71	925	622.35	51	622.31	47	621.96	16	621.88	9	621.83	6	621.85	7	621.94	14	622.25	41	621.83	8
19	622.08	22	622.12	25	625.39	553	622.31	47	622.25	40	621.96	16	621.86	8	621.92	13	621.83	6	621.93	14	622.23	39	621.83	7
20	622.06	20	622.18	33	623.81	238	622.35	51	622.20	34	622.02	21	621.83	6	621.96	16	621.85	7	621.92	14	622.08	25	621.83	6
21	622.08	22	622.12	25	623.27	165	622.39	56	622.20	34	622.06	25	621.83	6	622.02	21	621.85	7	621.92	14	622.04	22	621.89	5
22	622.08	22	622.10	24	622.92	123	622.35	51	622.20	34	622.02	21	621.83	6	622.04	23	621.83	6	621.92	14	622.04	22	621.85	4
23	622.02	16	622.08	22	622.54	72	622.31	47	622.23	38	621.98	18	621.82	5	621.98	18	621.87	9	621.89	9	622.04	22	621.89	4
24	622.10	24	622.14	28	622.44	61	622.25	39	622.18	33	621.98	18	621.83	6	621.88	9	621.92	12	621.92	14	621.98	18	621.92	4
25	622.18	33	622.12	25	622.37	54	622.23	38	622.20	34	622.00	19	621.87	9	621.85	7	621.96	15	621.92	14	622.00	19	621.89	4
26	622.25	40	622.08	22	622.96	126	627.87	1262	622.29	44	621.96	16	621.87	9	621.84	7	621.91	12	621.92	14	622.04	22	621.96	4
27	622.23	38	622.08	22	626.08	745	624.02	272	622.54	72	621.92	13	621.85	7	621.83	6	621.87	9	621.92	14	622.12	29	621.94	4
28	622.46	64	622.06	20	629.71	800	622.79	103	622.48	66	621.96	16	621.81	4	621.83	6	621.83	6	621.94	14	622.12	29	621.92	4
29	623.39	180	......	.....	627.29	617	622.56	75	622.33	50	621.98	18	621.83	6	621.90	11	621.83	6	621.92	14	622.23	39	621.95	4
30	626.04	727	......	.....	625.33	537	622.60	80	622.25	40	622.03	22	621.83	6	621.93	14	621.87	9	621.92	14	622.20	37	621.92	4
31	625.25	517	......	.....	627.37	616	......	.....	622.16	30	......	.....	621.81	4	621.94	14	......	.....	621.98	18	......	.....	621.95	4

Monthly Discharge of Fairchild's Creek near Onondaga for 1913

Drainage Area 112 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	36	15	18	.32	.13	.16	.18
August	65	13	19	.58	.12	.17	.20
September	26	11	15	.23	.10	.13	.14
October	32	13	16	.29	.12	.14	.16
November	175	17	56	1.56	.15	.50	.56
December	40	16	25	.36	.14	.22	.25
The period	175	11	25	1.56	.10	.22	1.49

Monthly Discharge of Fairchild's Creek near Onondaga for 1914

Drainage Area, 112 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
January	727	12	65	6.49	.11	.59	.68
February	262	13	74	2.34	.12	.66	.69
March	980	22	286	8.75	.20	2.55	2.94
April	1,262	38	181	11.27	.34	1.62	1.81
May	1,440	30	146	12.86	.27	1.30	1.50
June	44	13	23	.39	.12	.21	.23
July	18	4	10	.16	.04	.09	.10
August	23	4	10	.21	.04	.09	.10
September	47	6	13	.42	.05	.12	.13
October	23	6	12	.21	.05	.11	.12
November	46	14	22	.41	.13	.20	.22
December	71	4	22	.63	.04	.20	.23
The year	1,440	4	72	12.86	.04	.65	8.75

Boston Creek near York

Location—At the first highway bridge above its confluence with the Grand River, ¼ mile from the Village of York, Township of Oneida, County of Haldimand.

Records Available—June 26th, 1913, to Dec. 31st, 1914.

Drainage Area—123 square miles.

Gauge—Vertical staff, 0 ft.—12 ft. on the downstream side of the left abutment. Elev. of zero on the gauge is 591.00, which has remained unchanged since established.

Channel—Clay and silt; shifting.

Discharge Measurements.—From the highway bridge during the high-water period. A permanent wading section is located 1,200 feet above this for the low-water period.

Floods.—A severe flood occurred in April, 1912. No extremely high water has occurred since the gauge was established.

Winter Flow.—From December to March the relation between gauge height and discharge is affected by ice, and measurements are made to determine the winter discharge. Anchor ice interfered with the measurements during February and part of March of 1914.

Accuracy.—The river stage at this section is affected by back water from the Grand River, and the results obtained can only be classed as fair.

Observer.—Mungo Peart.

Discharge Measurements of Boston Creek River near York in 1913-4

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1913							
June 26....	Roberts, E	33	13	1.20	592.19	16	....
Aug. 19....	"	33	12	1.08	592.02	13	....
Sept. 11....	"	33	13	1.11	592.10	15	....
Oct. 13....	"	33	14	.93	592.02	13	....
Nov. 6....	"	33	14	1.14	592.19	16	....
Dec. 10....	"	34	17	1.49	592.31	26	....
1914							
Feb. 12 (a)	"	60	129	.78	595.29	100	....
Mar. 28....	"	79	679	2.86	599.37	1941	....
April 1....	"	79	449	1.76	596.62	790	....
" 6....	"	79	252	1.08	594.08	272	....
" 7....	"	79	228	1.01	593.83	232	....
" 7....	"	79	220	.99	593.75	217	....
June 8....	"	31	19	1.20	592.29	23	....
" 16....	"	33	18	1.09	592.19	20	....
" 22....	"	36	14	.79	592.17	11	....
" 22....	"	36	14	.77	592.17	11	....
" 22....	"	35	13	.85	592.17	11	....
" 22....	"	35	14	.76	592.17	11	....
" 23....	"	45	21	.62	592.17	13	....
July 14....	"	45	20	.53	592.04	10	....
" 14....	"	45	19	.55	592.04	10	....
Aug. 11....	"	45	18	.46	591.96	8	....
" 11....	"	45	18	.48	591.96	9	....
" 12....	"	43	16	.36	591.87	6	....
" 12....	"	43	16	.37	591.87	6	....
Sept. 11....	"	49	27	.98	592.21	27	....
" 12....	"	48	27	.98	592.21	26	....
" 25....	"	46	22	.50	592.08	11	....
" 25....	"	46	22	.50	592.10	11	....
" 26....	"	46	22	.51	592.06	11	....
" 26....	"	46	22	.47	592.08	11	....
Oct. 8....	"	45	19	.41	591.98	7	....
" 8....	"	45	19	.40	591.96	7	....
" 9....	"	45	19	.39	591.96	7	....
" 22....	"	47	23	.56	592.14	13	....
" 23....	"	47	23	.54	592.14	12	....
Nov. 9....	"	47	24	.70	492.18	17	....
" 9....	"	47	25	.70	592.18	17	....
" 18 (b)	"	49	29	.87	592.75	25	....
" 18 (b)	"	49	29	.91	592.75	26	....
" 18 (b)	"	49	28	.87	592.75	25	....

(a) Ice conditions
(b) Backwater from Grand River.

Daily Gauge Height and Discharge of Boston Creek near York for 1913

Drainage Area 123 Square Miles

Day	January		February		March		April		May		June		July		August		September		October		November		December	
	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge	Gauge Ht.	Discharge
	Feet	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*	*Feet*	*Sec-ft.*
1	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.13	16	591.92	7	592.02	11	591.96	8	592.32	24	592.60	49
2	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.13	16	591.92	7	592.04	12	591.94	8	592.25	21	592.52	41
3	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.15	16	591.86	6	592.11	15	592.00	10	592.25	21	592.56	44
4	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.23	19	591.86	6	592.08	14	592.02	11	592.26	22	592.55	44
5	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.13	16	591.84	6	592.02	11	591.94	8	592.23	20	592.50	39
6	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.21	18	591.84	6	591.98	9	591.94	8	592.22	22	592.45	35
7	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.25	20	591.88	7	591.98	9	592.00	10	592.22	22	592.42	32
8	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.25	20	591.90	7	591.98	9	591.98	9	592.21	19	592.47	36
9	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.21	18	591.96	8	591.96	8	591.98	9	592.32	24	592.31	25
10	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.27	22	591.94	8	591.98	9	591.94	8	593.08	105	592.31	25
11	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.17	17	592.02	11	592.10	15	591.98	9	593.42	157	592.39	30
12	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.17	17	592.29	25	591.94	8	391.86	5	593.07	103	592.38	30
13	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.17	17	592.21	18	591.94	8	592.02	13	592.95	89	592.33	26
14	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.17	17	592.11	15	591.86	6	591.94	8	592.90	83	592.35	27
15	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.15	16	592.17	17	591.86	6	591.98	9	592.84	75	592.35	27
16	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.15	16	592.02	11	591.82	5	591.98	9	592.79	69	592.33	26
17	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.11	15	592.02	11	591.90	7	591.98	9	592.74	63	592.37	28
18	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.15	16	592.02	11	591.86	6	592.02	11	592.62	51	592.29	23
19	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.09	14	592.02	11	591.86	6	591.92	7	592.67	56	592.29	23
20	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.02	11	592.04	12	591.90	7	592.02	11	593.31	140	592.23	20
21	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	593.04	12	591.98	9	591.94	8	592.10	15	593.71	205	592.22	20
22	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.06	13	591.98	9	591.98	9	592.10	15	594.12	270	592.35	27
23	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.04	12	591.98	9	592.02	11	592.10	15	593.68	200	592.31	25
24	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	592.02	11	591.94	8	592.02	11	592.17	17	593.57	185	592.24	20
25	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.98	9	592.02	11	592.00	10	592.27	22	593.68	200	592.18	19
26	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.96	8	592.09	14	592.02	11	592.37	32	593.28	130	592.31	25
27	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.94	8	592.09	14	592.02	11	592.40	35	593.02	97	592.37	28
28	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.98	9	592.02	11	591.94	8	592.33	28	592.94	87	592.25	21
29	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.98	9	592.17	17	591.94	8	592.33	28	592.79	69	592.23	20
30	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.94	8	592.11	15	592.02	11	592.31	26	592.65	53	592.20	18
31	......	.....	......	.....	......	.....	......	.....	......	.....	......	.....	591.92	7	592.04	12	......	.....	592.31	26	......	.....	592.20	18

Daily Gauge Height and Discharge of Boston Creek near York for 1914

Drainage Area 123 Square Miles

Day	January Gauge Ht.	January Discharge	February Gauge Ht.	February Discharge	March Gauge Ht.	March Discharge	April Gauge Ht.	April Discharge	May Gauge Ht.	May Discharge	June Gauge Ht.	June Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	592.18	18	595.00	445	593.42	15	596.98	980	593.23	130	592.32	25
2	592.32	25	595.17	480	593.42	13	596.42	800	593.29	150	592.29	24
3	592.34	26	594.25	295	593.46	15	597.37	1110	593.04	100	592.18	18
4	592.21	19	593.77	210	593.56	16	595.83	640	592.87	79	592.29	24
5	592.29	23	593.77	210	593.71	16	594.79	410	593.12	110	592.35	27
6	592.48	37	594.50	250	593.71	16	594.18	290	594.18	275	592.31	25
7	592.27	22	595.35	240	593.75	17	593.79	220	594.52	355	592.31	25
8	592.22	20	596.92	215	593.64	17	593.66	200	594.12	265	592.73	62
9	592.22	20	596.29	215	593.66	16	593.48	165	593.50	170	593.60	49
10	592.24	21	595.81	190	593.62	15	593.31	140	593.23	130	592.85	79
11	592.38	23	595.58	145	593.52	15	593.06	105	592.96	90	592.60	49
12	592.43	20	595.29	101	593.50	13	593.04	105	592.83	79	592.44	34
13	592.66	27	594.94	95	593.39	150	593.00	95	592.94	88	592.35	27
14	592.57	23	594.58	80	593.98	250	592.92	85	593.06	102	592.23	17
15	592.58	23	594.29	64	594.77	395	592.83	74	593.08	105	592.25	19
16	592.50	18	594.14	45	597.20	1035	592.85	75	592.87	79	592.18	16
17	592.47	17	593.96	31	597.98	1310	592.85	75	592.71	60	592.12	13
18	592.63	26	593.77	26	598.81	1630	592.89	81	592.58	47	592.10	12
19	592.50	18	593.73	24	599.68	2150	592.92	85	592.46	36	592.14	14
20	592.48	23	593.64	22	598.44	1570	592.94	91	592.44	34	592.12	13
21	592.63	20	593.62	19	597.71	1250	593.20	130	592.39	30	592.08	12
22	592.67	22	593.52	17	596.73	885	593.37	150	592.37	28	592.12	13
23	592.61	19	593.46	15	596.18	740	593.18	126	592.31	25	592.10	12
24	592.63	20	593.48	14	595.29	515	593.06	110	592.23	20	592.14	14
25	592.66	22	593.48	14	594.54	360	592.92	90	592.27	22	592.12	13
26	592.75	27	593.44	14	594.50	350	594.00	260	592.37	28	593.12	13
27	592.98	92	593.44	16	595.75	620	593.89	230	592.48	38	592.12	13
28	593.08	185	595.44	17	599.29	1830	593.62	190	592.50	39	592.10	12
29	595.68	610	......	.....	598.44	1560	593.42	160	592.52	41	592.14	14
30	595.68	610	......	.....	597.00	990	593.25	135	592.42	32	592.14	14
31	595.20	490	......	.....	598.00	1315	......	.....	592.33	26	......	.....

Day	July Gauge Ht.	July Discharge	August Gauge Ht.	August Discharge	September Gauge Ht.	September Discharge	October Gauge Ht.	October Discharge	November Gauge Ht.	November Discharge	December Gauge Ht.	December Discharge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	592.10	12	591.89	7	592.29	24	592.06	11	592.06	11	592.92	85
2	292.12	13	591.92	7	592.75	65	592.00	10	592.14	14	593.16	115
3	592.14	14	591.92	7	592.83	74	591.98	9	592.14	14	593.52	170
4	592.12	13	591.92	7	592.77	67	591.92	7	592.16	15	593.33	140
5	592.06	11	591.92	7	592.60	49	591.98	9	592.14	14	593.12	110
6	592.06	11	591.92	7	592.52	41	592.06	11	592.14	14	592.89	81
7	592.12	13	591.94	8	592.54	43	592.00	10	592.18	16	592.25	65
8	592.08	12	591.94	8	592.46	36	592.00	10	592.10	13	592.48	38
9	592.08	12	591.92	7	592.35	27	591.94	8	592.12	13	592.35	27
10	592.08	12	591.94	8	592.29	23	591.98	9	592.12	13	592.29	14
11	592.08	12	591.94	8	592.31	25	591.87	6	592.12	13	592.35	16
12	592.00	10	591.92	7	592.20	17	591.94	8	592.14	14	592.46	18
13	592.06	11	591.92	7	592.10	13	592.02	10	592.27	22	592.35	13
14	592.04	11	591.96	8	592.16	15	592.08	12	592.14	14	592.27	10
15	592.04	11	591.96	8	592.14	14	592.16	15	592.23	19	592.81	20
16	592.04	11	591.96	8	592.12	13	592.16	15	592.42	32	592.77	17
17	592.04	11	592.00	10	592.12	13	592.25	20	592.56	45	592.75	16
18	592.04	11	591.96	8	592.08	12	592.10	13	592.73	62	592.75	16
19	592.04	11	592.00	10	592 06	11	592.14	14	592.64	53	592.79	18
20	592.00	10	591.98	9	591.96	8	592.14	14	592.52	41	592.73	15
21	592.00	10	592.04	11	592.04	11	592.16	15	592.37	28	592.79	18
22	592.02	10	592.00	10	592.10	13	592.12	13	592.39	30	592.73	15
23	592.04	11	592.16	15	592.10	13	592.12	13	592.42	32	592.68	13
24	592.00	10	592.29	21	592.10	13	592.10	13	592.31	25	592.71	11
25	592.02	10	592.23	17	592.10	13	592.02	10	592.35	27	592.68	10
26	591.94	8	592.18	16	592.08	12	592.12	13	592.39	30	592.75	12
27	591.96	8	592.14	14	591.96	8	592.10	13	592.42	32	592.62	8
28	591.94	8	592.12	13	592.06	11	592.10	13	592.54	43	592.68	7
29	591.92	7	592.16	15	592.10	13	592.06	11	592.87	79	592.79	11
30	591.89	7	592.02	10	592.08	12	592.10	13	592.94	87	592.75	10
31	591.89	7	592.08	12	......	.....	592.10	13	......	.....	592.79	11

Monthly Discharge of Boston Creek near York for 1913

Drainage Area 123 Square M s

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Maximum	Mean	Depth in Inches on Drainage Area
January	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....
March	....	....	....	....	....	....	....
April	....	....	....	....	....	....	....
May	....	....	....	....	....	....	....
June	....	....	....	....	....	....	....
July	22	7	14	.18	.06	.11	.13
August	25	6	11	.20	.05	.09	.10
September	15	6	9	.12	.05	.07	.08
October	35	5	14	.28	.04	.11	.13
November	270	19	89	2.19	.15	.72	.81
December	49	18	28	.40	.15	.22	.26
The period	270	5	27	2.19	.04	.22	1.51

Monthly Discharge of Boston Creek near York for 1914

Drainage Area 123 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in inches on Drainage Area
January	610	17	82	4.96	.14	.67	.77
February	480	14	125	3.90	.11	1.01	1.04
March	2150	13	615	17.48	.11	5.0	5.76
April	1110	74	247	9.02	.60	2.01	2.24
May	355	20	90	2.89	.16	.73	.85
June	79	12	23	.64	.10	.19	.21
July	14	7	10	.11	.06	.08	.09
August	21	7	10	.17	.06	.08	.09
September	74	8	23	.60	.07	.19	.21
October	20	6	11	.16	.05	.09	.11
November	87	11	29	.71	.09	.24	.27
December	170	7	36	1.38	.06	.29	.33
The year	2150	6	109	17.48	.05	.89	11.98

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations on Grand River for which such data are available in this report

Station	Drainage Area	1913												
		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Period
Grand River at Belwood	270	......	......	......	......	......	......	......	.02	.02	.03	.20	.14	.08
Grand River at Conestogo	538	......	......	......	......	......	......	......	.05	.04	.09	.44	.28	.18
Grand River at Galt	1,356	......	......	......	......	......	......	......	.11	.10	.18	.50	.24	.23
Grand River at Glenmorris	1,385	......	......	......	......	......	......	......	.18	.14	.20	.66	.19	.27
Grand River at Brantford	1,991	......	......	......	......	......	......	.23	.20	.17	.26	.72	.36	.32
Grand River at York	2,311	......	......	......	......	......	......	.21	.15	.14	.18	.76	.40	.31
Irvine River at Salem	64	......	......	......	......	......	......	......	......	......	......	.41	.18	.29
Conestogo River at St. Jacob's	312	......	......	......	......	......	......	......	.03	.03	.07	1.16	.83	.42
Speed River at Caraher's Bridge, near Guelph	80	......	......	......	......	......	......	......	......	......	......	.64	.30	.47
Speed River at Hespeler	259	......	......	......	......	......	......	......	......	......	......	.70	.46	.58
Galt Creek at Galt	48	......	......	......	......	......	......	......	.54	.56	.77	.95	.79	.72
Nith River near Canning	386	......	......	......	......	......	......	.38	.36	.32	.39	1.21	.68	.56
Whiteman's Creek near Burford	153	......	......	......	......	......	......	......	......	......	......	.71	.42	.57
Fairchild's Creek near Onondaga	112	......	......	......	......	......	......	.16	.17	.13	.14	.50	.22	.22
Boston Creek near York	123	......	......	......	......	......	......	.11	.09	.07	.11	.73	.23	.22

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations on Grand River for which such data are available in this report

Station	Drainage Area	1914												
		Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Grand River at Belwood	270	.14	.19	2.16	1.75	.36	.03	.01	.02	.02	.04	.30	.45	.43
Grand River at Conestogo	538	.35	.42	1.91	1.39	.36	.09	.05	.07	.11	.09	.36	.41	.47
Grand River at Galt	1356	.31	.33	1.79	1.35	.39	.17	.13	.13	.16	.14	.30	.34	.46
Grand River at Glenmorris	1385	.30	.45	2.74	1.55	.54	.16	.10	.11	.15	.13	.29	.39	.58
Grand River at Brantford	1991	.45	.88	2.02	1.54	.50	.24	.12	.11	.17	.17	.35	.42	.58
Grand River at York	2311	.44	.72	2.53	1.41	.54	.25	.15	.14	.19	.16	.28	.34	.60
Irvine River near Salem	64	.38	.65	3.05	1.38	.16	.02	.02	.02	.03	.02	.27	.24	.52
Conestogo River at St. Jacob's	312	.56	.44	4.78	1.37	.12	.01	.01	.02	.02	.02	.27	.29	.63
Speed River at Caraher's Bridge, near Guelph	80	.87	.31	3.28	1.14	.25	.03	.03	.09	.30	.13	.67	.34	.62
Speed River at Hespeler	259	.56	.78	1.57	1.36	.64	.40	.21	.24	.32	.18	.25	.27	.56
Galt Creek at Galt	48	.81	.32	1.83	.97	.71	.27	.19	.26	.33	.29	.54	.84	.61
Nith River near Canning	386	.92	.82	2.59	1.40	.69	.38	.23	.20	.26	.30	.68	.68	.76
Whiteman's Creek near Burford	153	.50	.68	1.44	1.57	1.16	1.26	.23	.21	.46	.24	.46	.67	.74
Fairchild's Creek near Onondaga	112	.59	.66	2.55	1.62	1.30	.21	.09	.09	.12	.11	.20	.20	.65
Boston Creek near York	123	.67	1.02	5.00	2.01	.74	.19	.09	.09	.19	.10	.24	.29	.89

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